Setting Pen tool preferences

You can specify preferences for the appearance of the Pen tool pointer, for previewing line segments as you draw, or for the appearance of selected anchor points. Selected line segments and anchor points are displayed using the outline color of the layer on which the lines and points appear.

To set Pen tool preferences:

1 Select the Pen tool, then select Edit > Preferences (Windows) or Flash > Preferences (Macintosh) and click the Editing tab.

2 Under Pen Tool, set the following options:

Show Pen Preview previews line segments as you draw. Flash displays a preview of the line segment as you move the pointer around the Stage, before you click to create the end point of the segment. If this option is not selected, Flash does not display a line segment until you create the end point of the segment.

Show Solid Points displays selected anchor points as hollow and deselected anchor points as solid. If this option is not chosen, selected anchor points are solid, and deselected anchor points are hollow.

Show Precise Cursors specifies that the Pen tool pointer appear as a cross-hair pointer, rather than the default Pen tool icon, for more precise placement of lines. Deselect the option to display the default Pen tool icon with the Pen tool.

Note: Press the Caps Lock key while working to switch between the cross-hair pointer and the default Pen tool icon.

3 Click OK.

Drawing straight lines with the Pen tool

To draw straight line segments with the Pen tool, you create anchor points—points on the line that determine the length of individual line segments.

To draw straight lines with the Pen tool:

1 Select the Pen tool.

2 Select Window > Properties and select stroke and fill attributes in the Property inspector. See "Using the Stroke Color and Fill Color controls in the Property inspector" on page 68.

3 Position the pointer on the Stage where you want the straight line to begin, and click to define the first anchor point.

4 Click again where you want the first segment of the straight line to end. Shift-click to constrain lines to multiples of 45°.

5 Continue clicking to create additional straight segments.

6 To complete the path as an open or closed shape, do one of the following:

▪ To complete an open path, double-click the last point, click the Pen tool in the toolbar, or Control-click (Windows) or Command-click (Macintosh) anywhere away from the path.

▪ To close a path, position the Pen tool over the first anchor point. A small circle appears next to the pen tip when it is positioned correctly. Click or drag to close the path.

▪ To complete the shape as is, select Edit > Deselect All or select a different tool in the toolbar.

Drawing curved paths with the Pen tool

You create curves by dragging the Pen tool in the direction you want the curve to go to create the first anchor point, and then dragging the Pen tool in the opposite direction to create the second anchor point.

When you use the Pen tool to create a curved segment, the anchor points of the line segment display tangent handles. The slope and length of each tangent handle determine the slope and the height, or depth, of the curve. Moving the tangent handles reshapes the curves of the path. See "Adjusting segments" on page 85.

To draw a curved path:

1 Select the Pen tool.

2 Position the Pen tool on the Stage where you want the curve to begin, and hold down the mouse button.

The first anchor point appears, and the pen tip changes to an arrowhead.

3 Drag in the direction you want the curve segment to be drawn. Shift-drag to constrain the tool to multiples of 45°.

As you drag, the tangent handles of the curve appear.

4 Release the mouse button.

The length and slope of the tangent handles determine the shape of the curve segment. You can move the tangent handles later to adjust the curve.

5 Position the pointer where you want the curve segment to end, hold down the mouse button, and drag in the opposite direction to complete the segment. Shift-drag to constrain the segment to multiples of 45°.

6 To draw the next segment of a curve, position the pointer where you want the next segment to end, and drag away from the curve.

Adjusting anchor points on paths

When you draw a curve with the Pen tool, you create curve points—anchor points on a continuous, curved path. When you draw a straight line segment, or a straight line connected to a curved segment, you create corner points—anchor points on a straight path or at the juncture of a straight and a curved path.

By default, selected curve points appear as hollow circles, and selected corner points appear as hollow squares.

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To convert segments in a line from straight segments to curve segments or the reverse, you convert corner points to curve points or the reverse.

You can also move, add, or delete anchor points on a path. You move anchor points using the Subselection tool to adjust the length or angle of straight segments or the slope of curved segments. You can nudge selected anchor points to make small adjustments.

Deleting unneeded anchor points on a curved path optimizes the curve and reduces the file size.

To move an anchor point:

- Drag the point with the Subselection tool.

To nudge an anchor point or points:

- Select the point or points with the Subselection tool and use the arrow keys to move the point or points.

To convert an anchor point, do one of the following:

- To convert a corner point to a curve point, use the Subselection tool to select the point, then Alt-drag (Windows) or Option-drag (Macintosh) the point to place the tangent handles.
- To convert a curve point to a corner point, click the point with the Pen tool.

To add an anchor point:

- Click a line segment with the Pen tool.

To delete an anchor point, do one of the following:

- To delete a corner point, click the point once with the Pen tool.
- To delete a curve point, click the point twice with the Pen tool. (Click once to convert the point to a corner point, and once more to delete the point.)
- Select the point with the Subselection tool and press Delete.

Adjusting segments

You can adjust straight segments to change the angle or length of the segment, or adjust curved segments to change the slope or direction of the curve.

When you move a tangent handle on a curve point, the curves on both sides of the point adjust. When you move a tangent handle on a corner point, only the curve on the same side of the point as the tangent handle adjusts.

To adjust a straight segment:

1 Select the Subselection tool, and select a straight segment.

2 Use the Subselection tool to drag an anchor point on the segment to a new position.

To adjust a curve segment:

• Select the Subselection tool and drag the segment.

Note: When you click the path, Flash shows the anchor points. Adjusting a segment with the Subselection tool may add points to the path.

To adjust points or tangent handles on a curve:

1 Select the Subselection tool, and select an anchor point on a curved segment.

A tangent handle appears for the point you selected.

2 To adjust the shape of the curve on either side of the anchor point, drag the anchor point, or drag the tangent handle. Shift-drag to constrain the curve to multiples of 45°. Alt-drag (Windows) or Option-drag (Macintosh) to drag tangent handles individually.

Painting with the Brush tool

The Brush tool draws brushlike strokes, as if you were painting. It lets you create special effects, including calligraphic effects. You can select a brush size and shape using the Brush tool modifiers.

Brush size for new strokes remains constant even when you change the magnification level for the Stage, so the same brush size appears larger when the Stage magnification is lower. For example, suppose you set the Stage magnification to 100% and paint with the Brush tool using the smallest brush size. Then, you change the magnification to 50% and paint again using the smallest brush size. The new stroke that you paint appears 50% thicker than the earlier stroke. (Changing the magnification of the Stage does not change the size of existing brush strokes.)

You can use an imported bitmap as a fill when painting with the Brush tool. See "Breaking apart groups and objects" on page 144.

If you have a Wacom pressure-sensitive tablet connected to your computer, you can vary the width and angle of the brush stroke by using the Brush tool Pressure and Tilt modifiers, and varying pressure on the stylus.

The Pressure modifier varies the width of brush strokes when you vary the pressure on the stylus. The Tilt modifier varies the angle of brush strokes when you vary the angle of the stylus on the tablet. The Tilt modifier measures the angle between the top (eraser) end of the stylus and the top (north) edge of the tablet. For example, if you hold the pen vertically against the tablet, the Tilt is 90°. The Pressure and Tilt modifiers are both fully supported for the eraser function of the stylus.

A variable-width brush stroke drawn with a stylus

To paint with the Brush tool:

1 Select the Brush tool.

2 Select Window > Properties and select a fill color in the Property inspector. See "Using the Stroke Color and Fill Color controls in the Property inspector" on page 68.

3 Click the Brush Mode modifier and select a painting mode:

   Paint Normal paints over lines and fills on the same layer.

   Paint Fills paints fills and empty areas, leaving lines unaffected.

   Paint Behind paints in blank areas of the Stage on the same layer, leaving lines and fills unaffected.

   Paint Selection applies a new fill to the selection when you select a fill in the Fill modifier or the Fill box of the Property inspector. (This option is the same as simply selecting a filled area and applying a new fill.)

   Paint Inside paints the fill in which you start a brush stroke and never paints lines. This works much like a smart coloring book that never allows you to paint outside the lines. If you start painting in an empty area, the fill doesn't affect any existing filled areas.

4 Select a brush size and brush shape from the Brush tool modifiers.

5 If a Wacom pressure-sensitive tablet is attached to your computer, you can select the Pressure modifier, the Tilt modifier, or both, to modify brush strokes.

   ■ Select the Pressure modifier to vary the width of your brush strokes by varying the pressure on your stylus.

   ■ Select the Tilt modifier to vary the angle of your brush strokes by varying the angle of the stylus on the Wacom pressure-sensitive tablet.

6 Drag on the Stage. Shift-drag to constrain brush strokes to horizontal and vertical directions.

Reshaping lines and shape outlines

You can reshape lines and shape outlines created with the Pencil, Brush, Line, Oval, or Rectangle tools by dragging with the Selection tool, or by optimizing their curves.

You can also use the Subselection tool to display points on lines and shape outlines and modify the lines and outlines by adjusting the points. For information on adjusting anchor points, see "Using the Pen tool" on page 81.

To display anchor points on a line or shape outline created with the Pencil, Brush, Line, Oval, or Rectangle tools:

1 Select the Subselection tool.

2 Click the line or shape outline.

Reshaping using the Selection tool

To reshape a line or shape outline, you can drag any point on a line using the Selection tool. The pointer changes to indicate what type of reshaping it can perform on the line or fill.

Flash adjusts the curve of the line segment to accommodate the new position of the moved point. If the repositioned point is an end point, you can lengthen or shorten the line. If the repositioned point is a corner, the line segments forming the corner remain straight as they become longer or shorter.
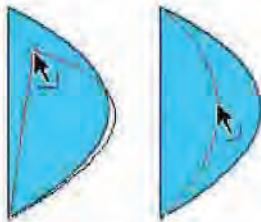
When a corner appears next to the pointer, you can change an end point. When a curve appears next to the pointer, you can adjust a curve.

Some brush stroke areas are easier to reshape if you view them as outlines.

If you are having trouble reshaping a complex line, you can smooth it to remove some of its details, making reshaping easier. Increasing the magnification can also make reshaping easier and more accurate; see "Optimizing curves" on page 89 or "Using the Stage" in Getting Started Help.

To reshape a line or shape outline using the Selection tool:

1 Select the Selection tool.

2 Do one of the following:

■ Drag from any point on the segment to reshape it.

■ Control-drag (Windows) or Option-drag (Macintosh) a line to create a new corner point.

Straightening and smoothing lines

You can reshape lines and shape outlines by straightening or smoothing them.

Note: You can adjust the degree of automatic smoothing and straightening by specifying preferences for drawing settings. See "Specifying drawing settings" on page 93.

Straightening makes small straightening adjustments to lines and curves you have already drawn. It has no effect on already straight segments.

You can also use the straightening technique to make Flash recognize shapes. If you draw any oval, rectangular, or triangular shapes with the Recognize Shapes option turned off, you can use the Straightening option to make the shapes geometrically perfect. (For information on the Recognize Shapes option, see "Specifying drawing settings" on page 93.) Shapes that are touching, and thus connected to other elements, are not recognized.
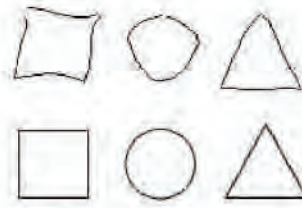
Shape recognition turns the top shapes into the bottom shapes.

Smoothing softens curves and reduces bumps or other variations in a curve's overall direction. It also reduces the number of segments in a curve. Smoothing is relative, however, and has no effect on straight segments. It is particularly useful when you are having trouble reshaping a number of very short curved line segments. Selecting all the segments and smoothing them reduces the number of segments, producing a gentler curve that is easier to reshape.

Repeated application of smoothing or straightening makes each segment smoother or straighter, depending on how curved or straight each segment was originally.

To smooth the curve of each selected fill outline or curved line:

* Select the Selection tool and click the Smooth modifier in the Options section of the toolbar, or select Modify > Smooth.

To make small straightening adjustments on each selected fill outline or curved line:

* Select the Selection tool and click the Straighten modifier in the Options section of the toolbar, or select Modify > Shape > Straighten.

To use shape recognition:

* Select the Selection tool and click the Straighten modifier, or select Modify > Shape > Straighten.

Optimizing curves

Another way to smooth curves is to optimize them. This refines curved lines and fill outlines by reducing the number of curves used to define these elements. Optimizing curves also reduces the size of the Flash document (FLA file) and the exported Flash application (SWF file). As with the Smooth or Straighten modifiers or commands, you can apply optimization to the same elements multiple times.

To optimize curves:

1 Select the drawn elements to be optimized and select Modify > Optimize.

2 In the Optimize Curves dialog box, drag the Smoothing slider to specify the degree of smoothing.

   The exact results depend on the curves selected. Generally, optimizing produces fewer curves, with less resemblance to the original outline.

3 Set additional options:

   Use Multiple Passes repeats the smoothing process until no further optimization can be accomplished; this is the same as repeatedly selecting Optimize with the same elements selected.

   Show Totals Message displays an alert box that indicates the extent of the optimization when smoothing is complete.

4 Click OK.

Erasing

Erasing with the Eraser tool removes strokes and fills. You can quickly erase everything on the Stage, erase individual stroke segments or filled areas, or erase by dragging.

You can customize the Eraser tool to erase only strokes, only filled areas, or only a single filled area. The Eraser tool can be either round or square, and it can have one of five sizes.

To quickly delete everything on the Stage:

• Double-click the Eraser tool.

To remove stroke segments or filled areas:

1 Select the Eraser tool, and then click the Faucet modifier.

2 Click the stroke segment or filled area that you want to delete.

To erase by dragging:

1 Select the Eraser tool.

2 Click the Eraser Mode modifier and select an erasing mode:

   Erase Normal erases strokes and fills on the same layer.

   Erase Fills erases only fills; strokes are not affected.

   Erase Lines erases only strokes; fills are not affected.

   Erase Selected Fills erases only the currently selected fills and does not affect strokes, selected or not. (Select the fills you want to erase before using the Eraser tool in this mode.)

   Erase Inside erases only the fill on which you begin the eraser stroke. If you begin erasing from an empty point, nothing is erased. Strokes are unaffected by the eraser in this mode.

3 Click the Eraser Shape modifier and select an eraser shape and size. Make sure that the Faucet modifier is not selected.

4 Drag on the Stage.

Modifying shapes

You can modify shapes by converting lines to fills, expanding the shape of a filled object, or softening the edges of a filled shape by modifying the curves of the shape.

The Convert Lines to Fills feature changes lines to fills, which allows you to fill lines with gradients or to erase a portion of a line. The Expand Shape and Soften Edges features allow you to expand filled shapes and blur the edges of shapes.

The Expand Fill and Soften Fill Edges features work best on small shapes that do not contain many small details. Applying Soften Edges to shapes with extensive detail can increase the file size of a Flash document and the resulting SWF file.

To convert lines to fills:

1 Select a line or multiple lines.

2 Select Modify > Shape > Convert Lines to Fills.

   Selected lines are converted to filled shapes. Converting lines to fills can make file sizes larger, but it can also speed up drawing for some animations.

To expand the shape of a filled object:

1 Select a filled shape. This command works best on a single filled color shape with no stroke.

2 Select Modify > Shape > Expand Fill.

3 In the Expand Path dialog box, enter a value in pixels for Distance and select Expand or Inset for Direction. Expand enlarges the shape, and Inset reduces it.

To soften the edges of an object:

1 Select a filled shape.

   Note: This feature works best on a single filled shape that has no stroke.

2 Select Modify > Shape > Soften Fill Edges.

3 Set the following options:

   Distance is the width, in pixels, of the soft edge.

   Number of Steps controls how many curves are used for the soft edge effect. The more steps you use, the smoother the effect. Increasing steps also creates larger files and slows drawing.

   Expand or Inset controls whether the shape is enlarged or reduced to soften the edges.

Snapping

To automatically align elements with one another, you can use snapping. Flash provides three ways for you to align objects on the Stage:

- Object snapping lets you snap objects directly to other objects along their edges.

- Pixel snapping lets you snap objects directly to individual pixels or lines of pixels on the Stage.

- Snap alignment lets you snap objects to a specified *snap tolerance*, a preset boundary between objects and other objects or between objects and the edge of the Stage.

Note: You can also snap to the grid or to guides. For more information, see "About the main toolbar and edit bar" in Getting Started Help.

Object snapping

Object snapping can be turned on using the Snap modifier for the Selection tool, or the Snap to Objects command in the View menu.

If the Snap modifier for the Selection tool is on, a small black ring appears under the pointer when you drag an element. The small ring changes to a larger ring when the object is within snapping distance of another object.

To turn object snapping on or off:

* Select View > Snapping > Snap to Objects. A check mark is displayed next to the command when it is on.

  When you move or reshape an object, the position of the Selection tool on the object provides the reference point for the snap ring. For example, if you move a filled shape by dragging near its center, the center point snaps to other objects. This is particularly useful for snapping shapes to motion paths for animating.

  Note: For better control of object placement when snapping, begin dragging from a corner or center point.

To adjust object snapping tolerances:

1 Select Edit > Preferences (Windows) or Flash > Preferences (Macintosh) and click the Editing tab.

2 Under Drawing Settings, adjust the Connect Lines setting. See "Specifying drawing settings" on page 93.

Pixel snapping

You can turn on pixel snapping using the Snap to Pixels command in the View menu. If Snap to Pixels is on, a pixel grid appears when the view magnification is set to 400% or higher. The pixel grid represents the individual pixels that will appear in your Flash application. When you create or move an object, it is constrained to the pixel grid.

To turn pixel snapping on or off:

* Select View > Snapping > Snap to Pixels.

  If the magnification is set to 400% or higher, a pixel grid is displayed. A check mark is displayed next to the command when it is on.

To turn pixel snapping on or off temporarily:

* Press the C key. When you release the C key, pixel snapping returns to the state you selected with View > Snapping > Snap to Pixels.

To temporarily hide the pixel grid:

* Press the X key. When you release the X key, the pixel grid reappears.

Snap alignment

You can turn on Snap Alignment using the Snap Align command in the View menu. You can select settings for Snap Alignment using the Edit Snap Align command in the View menu.

When you select Snap Alignment settings, you can set the snap tolerance between horizontal or vertical edges of objects, and between objects' edges and the Stage border. You can also turn on snap alignment between the horizontal and the vertical centers of objects. All Snap Alignment settings are measured in pixels.

When Snap Alignment is turned on, dotted lines appear on the Stage when you drag an object to the specified snap tolerance. For example, if you set Horizontal snap tolerance to 18 pixels (the default setting), a dotted line appears along the edge of the object you are dragging when the object is exactly 18 pixels from another object. If you turn on Horizontal Center Alignment, a dotted line appears along the horizontal center vertices of two objects when you precisely align the vertices.

To select settings for Snap Alignment:

1 Select View > Snapping > Edit Snap Align.

2 In the Snap Align dialog box, do any of the following:

- To set the snap tolerance between objects and the Stage border, enter a value for Movie Border.

- To set the snap tolerance between horizontal or vertical edges of objects, enter a value for Horizontal, Vertical, or both.

- To turn on Horizontal or Vertical Center Alignment, select Horizontal or Vertical Center Alignment or both.

To turn on Snap Alignment:

- Select Snapping > Snap Align.

Specifying drawing settings

You can set drawing settings to specify snapping, smoothing, and straightening behaviors when you use Flash drawing tools. You can change the tolerance setting for each option, and turn each option off or on. Tolerance settings are relative, depending on the resolution of your computer screen and the current magnification of the scene. By default, each option is turned on and set to Normal tolerance.

To set drawing settings:

1 Select Edit > Preferences (Windows) or Flash > Preferences (Macintosh) and click the Editing tab.

2 Under Drawing Settings, select from the following options:

Connect Lines determines how close the end of a line being drawn must be to an existing line segment before the end point snaps to the nearest point on the other line. The available options are Must Be Close, Normal, and Can Be Distant. This setting also controls horizontal and vertical line recognition—that is, how nearly horizontal or vertical a line must be drawn before Flash makes it exactly horizontal or vertical. When Snap to Objects is turned on, this setting controls how close objects must be to snap to one another.

Smooth Curves specifies the amount of smoothing applied to curved lines drawn with the Pencil tool when the drawing mode is set to Straighten or Smooth. (Smoother curves are easier to reshape, whereas rougher curves match the original line strokes more closely.) The selections are Off, Rough, Normal, and Smooth.

Note: You can further smooth existing curved segments using Modify › Shape › Smooth and Modify › Shape › Optimize.

Recognize Lines defines how nearly straight a line segment drawn with the Pencil tool must be before Flash recognizes it as a straight line and makes it perfectly straight. The selections are Off, Strict, Normal, and Tolerant. If Recognize Lines is off while you draw, you can straighten lines later by selecting one or more line segments and selecting Modify > Shape > Straighten.

Recognize Shapes controls how precisely you must draw circles, ovals, squares, rectangles, and 90° and 180° arcs for them to be recognized as geometric shapes and redrawn accurately. The options are Off, Strict, Normal, and Tolerant. If Recognize Shapes is off while you draw, you can straighten lines later by selecting one or more shapes (for example, connected line segments) and selecting Modify > Shape > Straighten.

Click Accuracy specifies how close to an item the pointer must be before Flash recognizes the item. The options are Strict, Normal, and Tolerant.

CHAPTER 6
Working with Text

You can include text in your Macromedia Flash MX 2004 and Macromedia Flash MX Professional 2004 applications in a variety of ways. You can create text blocks containing *static* text, text whose contents and appearance you determine when you author the document. You can also create *dynamic* or *input* text fields. Dynamic text fields display dynamically updating text, such as sports scores or stock quotes. Input text fields allow users to enter text for forms, surveys, or other purposes.

Just like movie clip instances, text field instances are ActionScript objects that have properties and methods. By giving a text field an instance name, you can manipulate it with ActionScript. However, unlike with movie clips, you cannot write ActionScript code inside a text instance, because text instances don't have Timelines.

You can orient text horizontally, with left-to-right flow, or vertically (static text only), with left-to-right or right-to-left flow. You can select the following attributes for text: font, point size, style, color, tracking, kerning, baseline shift, alignment, margins, indents, and line spacing. See "Setting text attributes" on page 100.

The Check Spelling feature lets you to check spelling in text fields, as well as in scene and layer names, frame labels, ActionScript strings, and other places where text occurs in your document. See "Checking spelling" on page 107.

You can transform text as you would an object—rotating, scaling, skewing, and flipping it—and still edit its characters. See "About transforming text" on page 108. When you're working with horizontal text, you can link text blocks to URLs and make it selectable. See "Linking text to a URL (horizontal text only)" on page 109.

Timeline effects let you apply prebuilt animation effects to text, such as bouncing, fading in or out, and exploding. See "Using Timeline effects with text" on page 108.

When you work with Flash FLA files, Flash substitutes fonts in the FLA file with other fonts installed on your system if the specified fonts are not on your system. You can select options to control which fonts are used in substitution. Substitute fonts are used for display on your system only. The font selection in the FLA file remains unchanged. See "Substituting missing fonts" on page 111.

Flash also lets you create a symbol from a font so that you can export the font as part of a shared library and use it in other Flash documents. See "Creating font symbols" on page 105.

You can break text apart and reshape its characters. For additional text-handling capabilities, you can manipulate text in FreeHand and import the FreeHand file into Flash, or export the file from FreeHand as a SWF file. See "Breaking text apart" on page 109.

Flash documents can use Type 1 PostScript fonts, TrueType, and bitmap fonts (Macintosh only). You can check spelling by copying text to the Clipboard using the Movie Explorer and pasting the text into an external text editor. See "Using the Movie Explorer" on page 24.

You can preserve rich text formatting in text fields, using HTML tags and attributes. See "Preserving rich text formatting" on page 109.

When you use HTML text for the content of a dynamic or input text field, you can flow the text around an image, including a SWF or JPG file or a movie clip. See "Using HTML-formatted text" in ActionScript Reference Guide Help.

You can use ActionScript to format input and dynamic text, and to create scrolling text fields. ActionScript has events for dynamic and input text fields that you can capture and use to trigger scripts. For information on using ActionScript to control text, see "Working with Text" in ActionScript Reference Guide Help.

For an interactive introduction to creating text in Flash, select Help > How Do > Basic Flash > Add Static, Input, and Dynamic Text.

About Unicode text encoding in Flash applications

The Macromedia Flash Player 7 supports Unicode text encoding for SWF files in Macromedia Flash Player 7 format. This support greatly enhances your ability to use multilingual text in SWF files that you create with Flash, including multiple languages within a single text field. Any user with the Macromedia Flash Player 7 can view multilanguage text in a Macromedia Flash Player 7 application, regardless of the language used by the operating system running the player.

For information on Unicode support in Macromedia Flash, see Chapter 13, "Creating Multilanguage Text," on page 215.

About font outlines and device fonts

When you publish or export a Flash application containing static text, Flash creates outlines of the text and uses the outlines to display the text in the Flash Player.

When you publish or export a Flash application containing dynamic or input text fields, Flash stores the names of the fonts used in creating the text. The Flash Player uses the font names to locate identical or similar fonts on the user's system when the Flash application is displayed. You can also export font outlines with dynamic or input text by clicking the Character option in the Property inspector and selecting options. See "Setting dynamic and input text options" on page 104.

Not all fonts displayed in Flash can be exported as outlines with a Flash application. To verify that a font can be exported, you can use the View > Preview Mode > Antialias Text command to preview the text; jagged type indicates that Flash does not recognize that font's outline and will not export the text.

About using device fonts

For static horizontal text only, you can use special fonts in Flash called *device fonts* as an alternative to exporting font outline information. Device fonts are not embedded in the Flash SWF file. Instead, the Flash Player uses whatever font on the local computer most closely resembles the device font. Because device font information is not embedded, using device fonts results in a somewhat smaller SWF file. In addition, device fonts can be sharper and more legible than exported font outlines at small point sizes (below 10 points). However, because device fonts are not embedded, text may look different than expected in user systems that do not have an installed font corresponding to the device font.

Flash includes three device fonts, named _sans (similar to Helvetica or Arial), _serif (similar to Times Roman), and _typewriter (similar to Courier). To specify a font as a device font, you select one of the Flash device fonts in the Property inspector. During SWF file playback, Flash selects the first device font that is located on the user's system. See "Making text selectable by users" on page 104.

About masking device fonts

You can use a movie clip to mask text that is set in a device font and converted into a movie clip. For a movie clip mask on a device font to function, the user must have Flash Player 6 release 40 or later.

When you use a movie clip to mask text set in a device font, the rectangular bounding box of the mask is used as the masking shape. That is, if you create a nonrectangular movie clip mask for device font text in the Flash authoring environment, the mask that appears in the SWF file takes the shape of the rectangular bounding box of the mask, not the shape of the mask itself.

You can mask device fonts only by using a movie clip as a mask. You cannot mask device fonts by using a mask layer on the Stage.

For more information on using a movie clip as a mask, see "Using movie clips as masks" in ActionScript Reference Guide Help.

Creating text

You can create three types of text fields: static, dynamic, and input. All text fields support Unicode.

- Static text fields display text that doesn't change characters dynamically.
- Dynamic text fields display dynamically updating text, such as sports scores, stock quotes, or weather reports.
- Input text fields allow users to enter text in forms or surveys.

In Flash, you can create horizontal text (with a left-to-right flow) or static vertical text (with either a right-to-left or left-to-right flow). By default, text is created with horizontal orientation. You can select preferences to make vertical text the default orientation and to set other options for vertical text.

You can also create scrolling text fields. See "Creating scrolling text" on page 117.

To create text, you place text blocks on the Stage using the Text tool. When creating static text, you can place text on a single line that expands as you type, or in a fixed-width block (for horizontal text) or fixed-height block (for vertical text) that expands and wraps words automatically. When creating dynamic or input text, you can place text on a single line, or create a text block with a fixed width and height.

Flash displays a handle on the corner of a text block to identify the type of text block:
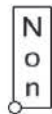
- For static horizontal text that extends, a round handle appears at the upper right corner of the text block.

  Non est quod contemnas hoc
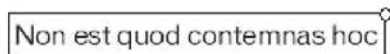
- For static horizontal text with a defined width, a square handle appears at the upper right corner of the text block.

  Non est quod contemnas hoc

- For static vertical text that has right-to-left orientation and extends, a round handle appears at the lower left corner of the text block.

  N
  o
  n

- For static vertical text with right-to-left orientation and a fixed height, a square handle appears at the lower left corner of the text block.

  N
  o
  n
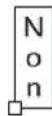
- For static vertical text that has left-to-right orientation and extends, a round handle appears at the lower right corner of the text block.

  N
  o
  n

- For static vertical text with left-to-right orientation and a fixed height, a square handle appears at the lower right corner of the text block.

  N
  o
  n

- For dynamic or input text blocks that extend, a round handle appears at the lower right corner of the text block.

  Non est quod contemnas hoc

- For dynamic or input text with a defined height and width, a square handle appears at the lower right corner of the text block.

  Non est quod contemnas hoc

- For dynamic scrollable text blocks, the round or square handle becomes solid black instead of hollow. See "Creating scrolling text" on page 117.

> Non est quod contemnas hoc

You can Shift-double-click the handle of dynamic and input text fields to create text blocks that don't expand when you enter text on the Stage. This allows you to create a text block of a fixed size and fill it with more text than it can display to create scrolling text. See "Creating scrolling text" on page 117.

After you use the Text tool to create a text field, you use the Property inspector to indicate which type of text field you want and set values to control how the text field and its contents appear in the SWF file.

To set preferences for vertical text:

1 Select Edit > Preferences (Windows) or Flash > Preferences (Macintosh) and click the Editing tab in the Preferences dialog box.

2 Under Vertical Text, select Default Text Orientation to automatically give new text blocks vertical orientation.

3 Select Right to Left Text Flow to make vertical text automatically flow right to left.

4 Select No Kerning to prevent kerning from being applied to vertical text. (Kerning remains enabled for horizontal text.) For more information on kerning, see "Setting character spacing, kerning, and character position" on page 102.

To create text:

1 Select the Text tool.

2 Select Window > Properties.

3 In the Property inspector, select a text type from the pop-up menu to specify the type of text field:

Dynamic Text creates a field that displays dynamically updating text.

Input Text creates a field in which users can enter text.

Static Text creates a field that cannot update dynamically.

4 For static text only: In the Property inspector, click the Text Direction button (in the top row, to the right of the Italic button) and select an option to specify the orientation of the text:

Horizontal makes text flow horizontally, left to right (the default setting).

Vertical Left-to-Right makes text flow vertically, left to right.

Vertical Right-to-Left makes text flow vertically, right to left.

Note: Layout options for vertical text are disabled if the text is dynamic or input. Only static text can be vertical.

5 Do one of the following:

- ■ To create a text block that displays text in a single line, click where you want the text to start.
- ■ To create a text block with a fixed width (for horizontal text) or fixed height (for vertical text), position the pointer where you want the text to start and drag to the desired width or height.

Note: If you create a text block that extends past the edge of the Stage as you type, the text isn't lost. To make the handle accessible again, add line breaks, move the text block, or select View > Work Area.

6 Select text attributes in the Property inspector as described in "Setting text attributes" on page 100.

To change the dimensions of a text block:

- • Drag its resize handle.

To switch a text block between fixed-width or fixed-height and extending:

- • Double-click the resize handle.

Creating scrolling text

There are several ways to create scrolling text in Flash. You can easily make dynamic text fields scrollable using menu commands or the text block handle.

You can also add a ScrollBar component to a text field to make it scroll. For more information, see "ScrollBar component" in Using Components Help.

If you wish to use ActionScript, you can use the scroll and maxscroll properties of the TextField object to control vertical scrolling and the hscroll and maxhscroll properties to control horizontal scrolling in a text block. See "Creating scrolling text" in ActionScript Reference Guide Help.

To make a dynamic text block scrollable, do one of the following:

- • Shift-double-click the handle on the dynamic text block.
- • Select the dynamic text block with the Selection tool and select Text > Scrollable.
- • Select the dynamic text block with the Selection tool. Right-click (Windows) or Control-click (Macintosh) the dynamic text block and select Text > Scrollable.

Setting text attributes

You can set the font and paragraph attributes of text. Font attributes include font family, point size, style, color, character spacing, autokerning, and character position. Paragraph attributes include alignment, margins, indents, and line spacing.

You can optimize text to make text more readable at small sizes. See "About aliasing text" on page 101.

For static text, font outlines are exported in a published SWF file. You can choose to use device fonts, rather than exporting font outlines (horizontal text only). See "About font outlines and device fonts" on page 96.

For dynamic or input text, Flash stores the names of the fonts used in creating the text. The Flash Player uses the names to locate identical or similar fonts on the user's system when the Flash application is playing. You can also choose to embed font outlines in dynamic or input text fields. Embedding font outlines can increase file size, but it ensures that users have the correct font information. See "Setting dynamic and input text options" on page 104.

When text is selected, you use the Property inspector to change font and paragraph attributes, and to direct Flash to use device fonts rather than embedding font outline information.

When creating new text, Flash uses the current text attributes. To change the font or paragraph attributes of existing text, you must first select the text.

About aliasing text

The Alias Text button in the Property inspector lets you render text so that it appears more readable at small sizes. This option is supported for static, dynamic, and input text if the end user has the Flash Player 7 or later. It is supported only for static text if the user has an earlier version of the Flash Player. See "Choosing a font, point size, style, and color" on page 101.

The Alias Text option makes small text more readable by aligning text outlines along pixel boundaries. This makes the text appear aliased, even when anti-aliasing is enabled. For information on anti-aliasing text, see "Speeding up document display" on page 36.

When Alias Text is enabled, all text in the current selection is affected. The feature operates with text of all point sizes in the same way.

When using small text in a Flash document, keep in mind the following guidelines:

- Very small text (below 8 points) may not be displayed clearly, even with Alias Text selected.
- Sans serif text, such as Helvetica or Arial, appears clearer at small sizes than serif text.
- Some type styles, such as bold and italic, can reduce readability of text at small sizes.
- In some cases, text in Flash appears somewhat smaller than text of the same point size in other applications.

Choosing a font, point size, style, and color

You can set the font, point size, style, and color for selected text using the Property inspector. When setting the text color, you can use only solid colors, not gradients. To apply a gradient to text, you must convert the text to its component lines and fills. See "Breaking text apart" on page 109.

To select a font, point size, style, and color with the Property inspector:

1 Select the Text tool.

2 To apply settings to existing text, use the Text tool to select a text block or text blocks on the Stage.

3 If the Property inspector is not visible, select Window > Properties.

4 In the Property inspector, click the triangle next to the Font text box and select a font from the list, or enter a font name.

   Note: The fonts _sans, _serif, and _typewriter are device fonts. Font outline information for these fonts is not embedded in the Flash SWF file. Device fonts can be used only with horizontal text. See "About font outlines and device fonts" on page 96.

5 Click the triangle next to the Point Size value and drag the slider to select a value, or enter a font size value.

   Text size is set in points, regardless of the current ruler units.

6 To apply bold or italic style, click the Bold button or the Italic button.

7 Click the Alias Text button (directly below the Bold button) to optimize text.

8 To select a fill color for text, click the color box and do one of the following:

   ■ Select a color from the color pop-up window.

   ■ Type a color's hexadecimal value in the text box in the color pop-up window.

   ■ Click the Color Picker button in the upper right corner of the pop-up window and select a color from the system Color Picker.

   For more information on selecting colors, see Chapter 4, "Working with Color," on page 67.

Setting character spacing, kerning, and character position

Character spacing inserts a uniform amount of space between characters. You use character spacing to adjust the spacing of selected characters or entire blocks of text.

Kerning controls the spacing between pairs of characters. Many fonts have built-in kerning information. For example, the spacing between an *A* and a *V* is often less than the spacing between an *A* and a *D*. To use a font's built-in kerning information to space characters, you use the Kern option.

For horizontal text, tracking and kerning set the horizontal distance between characters. For vertical text, tracking and kerning set the vertical distance between characters.

For vertical text, you can set kerning to be off by default in Flash Preferences. When kerning is turned off for vertical text in Preferences, you can leave the option selected in the Property inspector, and kerning will be applied to horizontal text only. To set preferences for vertical text, see "Creating text" on page 97.

Using the Property inspector, you can also apply superscript or subscript styles to your text.

To set character spacing, kerning, and character position:

1 Select the Text tool.

2 To apply settings to existing text, use the Text tool to select a text block or text blocks on the Stage.

3 If the Property inspector is not already displayed, select Window > Properties.

4 In the Property inspector, set the following options:

- To specify character spacing, click the triangle next to the Character Spacing value and drag the slider to select a value, or enter a value in the text box.

- To use a font's built-in kerning information, select Kern.

- To specify character position, click the triangle next to the Character Position option and select a position from the menu: Normal places text on the baseline, Superscript places text above the baseline (horizontal text) or to the right of the baseline (vertical text), and Subscript places text below the baseline (horizontal text) or to the left of the baseline (vertical text).

Setting alignment, margins, indents, and line spacing

Alignment determines the position of each line of text in a paragraph relative to edges of the text block. Horizontal text is aligned relative to the left and right edges of the text block, and vertical text is aligned relative to the top and bottom edges of the text block. Text can be aligned to one edge of the text block, centered in the text block, or aligned to both edges of the text block (full justification).

Margins determine the amount of space between the border of a text block and a paragraph of text. Indents determine the distance between the margin of a paragraph and the beginning of the first line. For horizontal text, indents move the first line to the right the specified distance. For vertical text, indents move the first line down the specified distance.

Line spacing determines the distance between adjacent lines in a paragraph. For vertical text, line spacing adjusts the space between vertical columns.

To set alignment, margins, indents, and line spacing for horizontal text:

1 Select the Text tool.

2 To apply settings to existing text, use the Text tool to select a text block or text blocks on the Stage.

3 Select Window > Properties.

4 In the Property inspector, click Format Options and set the following options:

- To set alignment, click the Left, Center, Right, or Full Justification button.

- To set left or right margins, click the triangle next to the Left Margin or Right Margin value and drag the slider to select a value, or enter a value in the numeric field.

- To specify indents, click the triangle next to the Indent value and drag the slider to select a value, or enter a value in the numeric field. (Either the right or left line is indented, depending on whether the text flows right to left or left to right.)

- To specify line spacing, click Format options. Click the triangle next to the Line Spacing value and drag the slider to select a value, or enter a value in the numeric field.

To set alignment, margins, indents, and line spacing for vertical text:

1 Select the Text tool.

2 To apply settings to existing text, select a text block or text blocks on the Stage.

3 Select Window > Properties.

4 In the Property inspector, click Format Options and set the following options:

- To set alignment, click the Top, Center, Bottom, or Full Justification button.

- To set top or bottom margins, use the Left or Right margin control. Click the triangle next to the Left Margin value to set the top margin or the Right Margin value to set the bottom margin and drag the slider to select a value, or enter a value in the numeric field.

- To specify indents, click the triangle next to the Indent value and drag the slider to select a value, or enter a value in the numeric field.

- To specify line spacing, click the triangle next to the Line Spacing value and drag the slider to select a value, or enter a value in the numeric field.

Making text selectable by users

When working with static horizontal text, you can specify that fonts be selectable by users viewing your Flash application. After selecting text, the user can copy, cut, and then paste the text into a new document.

To make horizontal text selectable by a user:

1 Select the horizontal text that you want to make selectable by a user.

2 Select Window > Properties.

3 In the Property inspector, select Static Text or Dynamic Text (Input Text is selectable by default).

4 Click the Selectable button.

Using device fonts (static horizontal text only)

When you create static text, you can specify that Flash Player use device fonts to display certain text blocks. Using device fonts can decrease the file size of your document, because the document does not contain font outlines for the text. Using device fonts can also increase legibility at text sizes below 10 points.

You can use movie clips to mask text set in device fonts. See "About masking device fonts" on page 97.

To specify that text be displayed using a device font:

1 Select text blocks on the Stage containing text that you want to display using a device font.

2 Select Window > Properties.

3 In the Property inspector, select Static Text from the pop-up menu.

4 Select Use Device Fonts.

Setting dynamic and input text options

The Property inspector lets you specify options that control how dynamic and input text appears in the Flash application.

To set options for dynamic and input text:

1 Click in an existing dynamic text field.

   To create a new dynamic text field, see "Creating text" on page 97.

2 In the Property inspector, make sure Dynamic or Input is displayed in the pop-up menu. Do any of the following:

   ■ For Instance Name, enter the instance name for the text field.

   ■ Lock height, width, and location of text.

   ■ Select font type and style.

   ■ Select Multiline to display the text in multiple lines, Single Line to display the text as one line, or Multiline No Wrap to display text in multiple lines that break only if the last character is a breaking character, such as Enter (Windows) or Return (Macintosh).

   ■ Click the Selectable button to enable users to select dynamic text. Deselect this option to prevent users from selecting the dynamic text.

   ■ Click the Render Text as HTML button to preserve rich text formatting, such as fonts and hyperlinks, with the appropriate HTML tags. See "Preserving rich text formatting" on page 109.

   ■ Click the Show Border button to display a black border and white background for the text field.

   ■ For Variable, enter the variable name for the text field.

   ■ Select Character for embedded font outlines options. In the Character Options dialog box, click No characters not to embed font outlines or Specify Range to embed fonts outlines. When Specify Range is selected, you can select one or more options from the scrolling list, type only the characters to embed in the document, or click Auto Fill to copy each unique character from the selected text to the text box. Then click OK.

Creating font symbols

To use a font as a shared library item, you can create a font symbol in the Library panel. You then assign the symbol an identifier string and a URL where the document containing the font symbol will be posted. In this way, you can link to the font and use it in a Flash application.

Note: When using font symbols for dynamic or input text, you must also embed the font outline information. See "Setting dynamic and input text options" on page 104.

For information on linking to a shared font symbol from other documents, see "Using shared library assets" on page 61.

To create a font symbol:

1 Open the library to which you want to add a font symbol.

2 Select New Font from the options menu in the upper right corner of the Library panel.

3 In the Font Symbol Properties dialog box, enter a name for the font symbol in the Name text box.

4 Select a font from the Font menu or enter the name of a font in the Font text box.

5 If you want to apply a style to the font, select Bold or Italic.

6 Click OK.

To assign an identifier string to a font symbol:

1 Select the font symbol in the Library panel.

2 Do one of the following:

   - Select Linkage from the options menu in the upper right corner of the Library panel.
   - Right-click (Windows) or Control-click (Macintosh) the font symbol name in the Library panel, and select Linkage from the context menu.

3 Under Linkage in the Linkage Properties dialog box, select Export for Runtime Sharing.

4 In the Identifier text box, enter a string to identify the font symbol.

5 In the URL text box, enter the URL where the SWF file that contains the font symbol will be posted.

6 Click OK.

To use the font in a Flash application, copy the font symbol into the destination FLA file. For more information, see "Copying library assets between documents" on page 60.

Editing text

You can use most common word-processing techniques to edit text in Flash. You use the Cut, Copy, and Paste commands to move text in a Flash file as well as between Flash and other applications.

Selecting text

When editing text or changing text attributes, you must first select the characters you want to change.

To select characters in a text block:

1 Select the Text tool.

2 Do one of the following:

   - Drag to select characters.
   - Double-click to select a word.
   - Click to specify the beginning of the selection and Shift-click to specify the end of the selection.
   - Press Ctrl+A (Windows) or Command+A (Macintosh) to select all the text in the block.

To select text blocks:

- Select the Selection tool and click a text block. Shift-click to select multiple text blocks.

Checking spelling

The Check Spelling feature enables you to check spelling in text throughout your Flash document.

You can use Spelling Setup to select a variety of options for spell checking:

- Select document options to specify which elements in a Flash document are to be checked, including text fields, scene and layer names, frame labels and comments, and others.
- Select one or more built-in dictionaries to use when checking spelling.
- Create a personal dictionary with words and phrases you add yourself.
- Select checking options to specify ways to handle specific word and character types, such as nonalphabetic words or Internet addresses, when spell checking.

When the Check Spelling feature identifies a word not found in the specified dictionary or dictionaries, you can select how to handle the word:

- Change the identified word or all occurrences of the word.
- Select a suggested word to use in changing the identified word.
- Ignore the identified word or all occurrences of the word.
- Add the identified word to your personal dictionary.
- Delete the identified word.

Using Spelling Setup

You use the Spelling Setup dialog box to specify options for the Check Spelling feature. Before you check spelling the first time, you must specify spelling options in the Spelling Setup dialog box to initialize the Check Spelling feature. After you initialize Check Spelling, you can use the Spelling Setup dialog box to change options for spell checking.

To use Spelling Setup:

1 Open the Spelling Setup dialog box. Do one of the following:
   - Select Text > Spelling Setup. (Use this option if you have not initialized the Check Spelling feature before.)
   - In the Check Spelling dialog box (Text > Check Spelling), click the Setup button.

2 In the Spelling Setup dialog box, select any of the items in the Document Options list to specify document-level spell checking options. You can select options to check spelling in specified text sources in a document, to select the text item during spell checking, and to enable live edit on the text item during spell checking.

3 In the Dictionaries scroll list, select one or more dictionaries from the Macromedia dictionaries installed with your product. You must select at least one dictionary to enable spell checking.

4 Under Personal Dictionary, enter a path or click the folder icon and browse to a document that you want to use as a personal dictionary.

5 To add words and phrases to your personal dictionary, click Edit Personal Dictionary. In the Personal Dictionary dialog box, enter each new item on a separate line in the text field. Click OK to save the items and close the dialog box.

6 Select any of the items under Checking Options to specify word-level spell checking options. You can select options to ignore specific word or character types, to find duplicate words, to split contracted or hyphenated words, or to suggest phonetic or typographical matches.

7 Click OK to save the settings and exit Spelling Setup.

Using the Check Spelling feature

To check spelling of text in a document, you use the Check Spelling feature, which checks spelling based on options you select in Spelling Setup. When the spell checker identifies a word not found in the dictionary or dictionaries, you can choose to change, ignore, or delete the word, or add it to the personal dictionary.

To use the Check Spelling feature:

1   Select Text > Check Spelling to view the Check Spelling dialog box.

The text box in the upper left corner identifies words not found in the selected dictionary or dictionaries, and also identifies the type of element where the text is located (such as text field, frame label, or other).

2   Do one of the following:

- Click the Add to Personal button to add the word to your personal dictionary.
- Click Ignore to leave the word unchanged. Click Ignore All to leave all occurrences of the word in the document unchanged.
- Enter a word in the Change To text box or select a word from the Suggestions scroll list. Then click Change to change the word or click Change All to change all occurrences of the word in the document.
- Click Delete to delete the word from the document.

3   To change Spelling Setup options, click Setup.

4   To end spell checking, do one of the following:

- Click Close to end spell checking before Flash reaches the end of the document.
- Continue spell checking until you see a notification that Flash has reached the end of the document, then click No to end spell checking. Click Yes to resume spell checking at the beginning of the document.

About transforming text

You can transform text blocks in the same ways that you transform other objects. You can scale, rotate, skew, and flip text blocks to create interesting effects. When you scale a text block as an object, increases or decreases in point size are not reflected in the Property inspector.

The text in a transformed text block can still be edited, although severe transformations may make it difficult to read.

For more information about transforming text blocks, see Chapter 8, "Working with Graphic Objects," on page 133.

Using Timeline effects with text

You can use Timeline effects to easily add animation to text. Timeline effects are prebuilt animation effects that let you add motion to text with a minimum of effort. For example, you can use Timeline effects to make text bounce, fade in or out, or explode. For more information on using each effect, see "Using Timeline effects" on page 145.

Breaking text apart

You can break apart text to place each character in a separate text block. After you break text apart, you can quickly distribute the text blocks to separate layers and animate each block separately. For information on distributing objects to layers, see "Distributing objects to layers for tweened animation" on page 151. For general information on animation, see Chapter 9, "Creating Motion," on page 145.

Note: You cannot break apart text in scrollable text fields.

You can also convert text to its component lines and fills to reshape, erase, and otherwise manipulate it. As with any other shape, you can individually group these converted characters, or change them to symbols and animate them. After you convert text to lines and fills, you can no longer edit the text.

To break apart text:

1   Select the Selection tool and click a text block.

2   Select Modify > Break Apart. Each character in the selected text is placed in a separate text block. The text remains in the same position on the Stage.

3   Select Modify > Break Apart again to convert the characters to shapes on the Stage.

Note: The Break Apart command applies only to outline fonts such as TrueType fonts. Bitmap fonts disappear from the screen when you break them apart. PostScript fonts can be broken apart only on Macintosh systems.

Linking text to a URL (horizontal text only)

You can link horizontal text to a URL so that users can jump to other files by clicking the text.

To link horizontal text to a URL:

1   Select some text or a text block. Do one of the following:
   - Use the Text tool to select text in a text block.
   - Use the Selection tool to select a text block on the Stage. This links all the text in the block to a URL.

2   If the Property inspector is not already displayed, select Window > Properties.

3   For Link, enter the URL to which you want to link the text block.

   Note: To create a link to an e-mail address, use the mailto: URL. For example, for the Macromedia Flash Wish URL, enter **mailto:wish-flash@macromedia.com**.

Preserving rich text formatting

Flash lets you preserve rich text formatting in input and dynamic text fields. If you select the Render Text as HTML formatting option in the Property inspector or set the html property of the TextField object to true, Flash preserves basic text formatting (such as font, style, color, and size) and hyperlinks in the text field by automatically applying the corresponding HTML tags when you export the SWF file. You apply HTML tags to text fields as the value of the htmlText property of the TextField object. You must give the text field an instance name to use the htmlText property.

If you will publish your Flash document as Flash Player 5 or earlier, you can use the text field variable to apply HTML tags to text fields.

The following HTML tags are supported in text fields: a, b, font color, font face, font size, i, p, and u.

The following HTML attributes are supported in text fields: leftmargin, rightmargin, align, indent, and leading.

To use the text field instance name to preserve rich text formatting:

1 Do one of the following to assign an instance name to the text field:

   - Use the Text tool to create a text field on the Stage. Assign the text field an instance name in the Property inspector.

   - Use the ActionScript createTextField method to create a text field dynamically. Assign the text field an instance name as a parameter of the createTextField method.

2 Do one of the following:

   - Select the Render Text as HTML option in the Property inspector.

   - In the Actions panel, set the html property of the TextField object to true, as in the following:

     ```
     instanceName.html = true;
     ```

3 In the Actions panel, set the htmlText property to a value that includes HTML tags.

   For example, if you have a dynamic text field on the Stage with the instance name instName, the following code renders the text in bold:

   ```
   instName.htmlText = "<b>Chris</b>";
   ```

To use the text field variable to preserve rich text formatting:

1 Select a text field on the Stage.

2 Assign the text field a variable name in the Property inspector.

3 Do one of the following:

   - Select the Render Text as HTML option in the Property inspector.

   - In the Actions panel, set the html property of the TextField object to true.

4 Set the text field variable to a value that includes HTML tags.

   For example, the following code assigns a value to a text field with the variable name txt. The text is rendered in bold if you select the Render Text as HTML option in the Property inspector, or if the html property is set to true:

   ```
   txt = "<b>Chris</b>";
   ```

   In the following example, the variable name of the text field is also txt. Because the value of the html property of the TextField object is set to true, you can use the variable name to render the text field in bold without selecting the Render Text as HTML option in the Property inspector:

   ```
   instName.html = true;
   txt = "<b>Chris</b>";
   ```

Substituting missing fonts

If you work with a document containing fonts that aren't installed on your system (for example, a document you received from another designer), Flash substitutes the missing fonts with fonts available on your system. You can select which fonts on your system are substituted for the missing fonts, or you can let Flash substitute missing fonts with the Flash System Default Font (specified in General Preferences).

Note: Substituting missing fonts while editing a Flash document does not change the fonts that are specified in the Flash document.

If you install a previously missing font on your system and restart Flash, the font is displayed in any documents using the font, and the font is removed from the Missing Fonts dialog box.

Selecting substitute fonts

An alert box indicating missing fonts in a document appears the first time a scene containing a missing font is displayed on the Stage. If you publish or export the document without displaying any scenes containing the missing fonts, the alert box appears during the publish or export operation. If you choose to select substitute fonts, the Font Mapping dialog box appears, listing all missing fonts in the document and letting you select a substitute for each.

Note: If the document contains many missing fonts, a delay may occur while Flash generates the list of missing fonts.

You can apply the missing font to new or existing text in the current document. The text is displayed on your system using the substitute font, but the missing font information is saved with the document. If the document is reopened on a system that includes the missing font, the text is displayed in that font.

Text attributes such as font size, leading, kerning, and so on may need to be adjusted when the text is displayed in the missing font, because the formatting you apply is based on the appearance of the text in the substitute font.

To specify font substitution:

1 Specify a font substitution preference. When the Missing Fonts alert appears, do one of the following:
   - Click Select Substitute Fonts to select substitute fonts from fonts installed on your system and proceed to step 2.
   - Click Use Default to use the Flash System Default Font to substitute all missing fonts and to dismiss the Missing Fonts alert.

2 In the Font Mapping dialog box, click a font in the Missing Fonts column to select it. Shift-click to select multiple missing fonts, to map them all to the same substitute font.

   The default substitute fonts are displayed in the Mapped To column, until you select substitute fonts.

3 Select a font from the Substitute Font pop-up menu.

4 Repeat steps 2–3 for all missing fonts.

5 Click OK.

Working with substitute fonts

You can use the Font Mapping dialog box to change the substitute font mapped to a missing font, to view all the substitute fonts you have mapped in Flash on your system, and to delete a substitute font mapping from your system. You can also turn off the Missing Fonts alert to prevent the alert from appearing.

When you work with a document that includes missing fonts, the missing fonts are displayed in the font list in the Property inspector. When you select substitute fonts, the substitute fonts are also displayed in the font list.

To view all the missing fonts in a document and reselect substitute fonts:

1 With the document active in Flash, select Edit > Font Mapping.

2 Select a substitute font, as described in the preceding procedure.

To view all the font mappings saved on your system and delete font mappings:

1 Close all documents in Flash.

2 Select Edit > Font Mapping.

3 To delete a font mapping, select the mapping and press Delete.

4 Click OK.

To turn off the Missing Fonts alert, do one of the following:

• To turn the alert off for the current document, in the Missing Fonts alert box select Don't Show Again for This Document, Always Use Substitute Fonts. Select Edit > Font Mapping to view mapping information for the document again.

• To turn the alert off for all documents, select Edit > Preferences (Windows) or Flash > Preferences (Macintosh) and click the Warnings tab. Deselect Warn on Missing Font and click OK. Select the option again to turn alerts on.

Controlling text with ActionScript

A dynamic or input text field is an instance of the ActionScript TextField object. When you create a text field, you can assign it an instance name in the Property inspector. You can use the instance name in ActionScript statements to set, change, and format the text field and its content using the TextField and TextFormat objects.

The TextField object has the same properties as the MovieClip object, and has methods that let you set, select, and manipulate the text. The TextFormat object lets you set character and paragraph values for the text. You can use these ActionScript objects instead of the text Property inspector to control the settings of a text field.

You can use a text field's variable name or instance name to assign it text that contains HTML tags. Flash preserves the rich text formatting applied to the text field with ActionScript.

If you assign a variable to a text field, the text field displays the variable's value. You can use ActionScript to pass the variable to other parts of the Flash application, to a server-side application for storing in a database, and so on. You can also replace the value of the variable by reading it from a server-side application or by loading it from another part of the Flash application. For more information on using variables, see "About variables" in ActionScript Reference Guide Help. For more information about connecting to external applications, see "Working with External Data" in ActionScript Reference Guide Help.

Creating and removing text fields dynamically

You can use the createTextField method of the MovieClip object to create a new, empty text field as a child of the movie clip that calls the method. You can use the removeTextField method to remove a text field created with createTextField; this method will not work on a text field created manually on the Timeline.

When you create a text field, you can use the TextField object to set properties of the text field. If you don't set the properties, the new text field receives a set of default properties. The default properties of the new text field are as follows:

```
type = "dynamic"
border = false
background = false
password = false
multiline = false
html = false
embedFonts = false
variable = null
maxChars = null
```

After you create a text field, you can use the TextFormat object to format the text. You must create a new TextFormat object and then pass it as a parameter to the setTextFormat method of the TextField object. A text field created with the createTextField method receives the following default TextFormat object:

```
font = "Times New Roman"
size = 12
color = 0x000000
bold = false
italic = false
underline = false
url = ""
target = ""
align = "left"
leftMargin = 0
rightMargin = 0
indent = 0
leading = 0
bullet = false
tabStops = [] (empty array)
```

To create a dynamic text field:

1 Select a frame, button, or movie clip that will receive the action.

2 Select Window > Development Panels > Actions to open the Actions panel if it isn't already open.

3 In the Actions toolbox, select the Built-in Classes category, then select the Movie category, then select the MovieClip category, and then select the Methods category. Finally, double-click the `createTextField` method.

4 Select the placeholder `instanceName` and enter an instance name or path for the movie clip that will be the parent of the new text field. For this example, enter the alias **_root** because the main Timeline is the parent.

5 Enter values for the following parameters:

   ■ *Instance Name* is the instance name of the new text field. For this example, enter **myText**.

   ■ *Depth* is a number that specifies the stacking order. For this example, enter **1**.

   ■ *X* is the *x* coordinate relative to the parent clip. For this example, enter **50**.

   ■ *Y* is the *y* coordinate relative to the parent clip. For this example, enter **50**.

   The following code is displayed in the Script pane:

   ```
   _root.createTextField("mytext",1,50,50,200,100);
   ```

6 In the Actions toolbox, select the Built-in Classes category, then select the Movie category, then select the TextField category, and then select the Properties category. Finally, double-click the `text` property to create a new line. For this example, replace the placeholder `instanceName` with **myText** in the Object parameter field.

7 In the Value field, enter **this is my first text field object text**. The following text is displayed in the Script pane:

   ```
   mytext.text = "this is my first text field object text";
   ```

   This example creates a text field with an instance name `myText`, a depth of 1, a width of 200, a height of 100, an *x* value of 50, and a *y* value of 50.

For a detailed description of the `createTextField` method of the TextField object, see "TextField class" in ActionScript Dictionary Help.

Setting text field properties dynamically

To use ActionScript to set the properties of a text field, you must assign the text field an instance name. If you create the text field on the Stage with the Text tool, you can assign the instance name in the Property inspector. If you create the text field dynamically, you can assign an instance name as a parameter of the `createTextField` method.

To set text field properties dynamically:

1 Select Window > Development Panels > Actions to open the Actions panel if it isn't already open.

2 Do one of the following to create a text field:

- Select the Text tool and create a text field on the Stage. Assign the text field an instance name in the Property inspector. For this example, enter the instance name **myText**.

- Double-click the `createTextField` method of the MovieClip object in the Actions toolbox to add it to the Script pane in the Actions panel. See "Creating text" on page 97. For this example, enter the instance name **myText** as a parameter of the `createTextField` method.

3 Do one of the following to place text in the text field:

- Enter text into the text field on the Stage.

- Set the `text` property of the TextField object. See "Creating text" on page 97.

4 In the Actions toolbox, select the Objects category, then select the Movie category, then select the TextField category, and then select the Property category. Finally, double-click the `multiline` property.

5 Enter the following parameters:

- *Object* is the instance name of the text field whose property you want to set.

- *Value* is the value of the property.

6 Repeat step 4 for the `wordWrap` and `border` properties. The following code appears in the Script pane:

```
mytext.multiline = true;
mytext.wordWrap = true;
mytext.border = true;
```

For a complete list of TextField object methods and detailed descriptions of each, see "TextField class" in ActionScript Dictionary Help.

Formatting text dynamically

You can use the ActionScript TextFormat object to set properties of a text field. A TextFormat object incorporates character and paragraph formatting information. Character formatting information describes the appearance of individual characters: font name, point size, color, and an associated URL. Paragraph formatting information describes the appearance of a paragraph: left margin, right margin, indention of the first line, and left, right, or center alignment.

First you must create a new TextFormat object. Then you can use the methods of the TextField object and pass them the TextFormat object as a parameter to format the text in a field.

Each character in a text field may individually be assigned a TextFormat object. The TextFormat object of the first character of a paragraph is examined to perform paragraph formatting for the entire paragraph.

To format text dynamically:

1 Select Window > Development Panels > Actions to open the Actions panel if it isn't already open.

2 Do one of the following to create a text field:

- Use the Text tool to create a text field on the Stage. Assign the text field an instance name in the Property inspector.

- For this example, enter the instance name **myText**.

- Use the `createTextField` method of the MovieClip object. See "Creating text" on page 97. For this example, enter the instance name **myText** as a parameter of the `createTextField` method.

3 Do one of the following to place text in the text field:

- Enter text into the text field on the Stage.

- Set the `text` property of the TextField object. See "Creating text" on page 97.

- In the Actions toolbox, select the Objects category, then select the Movie category, and then select the TextFormat category. Finally, double-click `new TextFormat`. For this example, enter **myformat** in the Object parameter field.

  The following code is displayed in the Script pane:

  ```
  myFormat = new TextFormat();
  ```

4 In the Actions toolbox, select the Objects category, then select the Movie category, then select the TextFormat category, and then select the Properties category. Finally, double-click `color`. Repeat this step for the `bullet` and `underline` properties. The following code is displayed in the Script pane:

```
myformat.color = 0xff0000;
myformat.bullet = true;
myformat.underline = true;
```

5 In the Actions toolbox, select the Objects category, then select the Movie category, then select the TextField category, and then select the Method category. Finally, double-click `setTextFormat`. For this example, enter **myText** in the Object parameter field.

6 In the Object field, enter the name of the TextFormat object you created in step 3, **myformat**. The following code appears in the Script pane:

```
mytext.setTextFormat(myformat);
```

For more information, see "Using the TextFormat class" in ActionScript Reference Guide Help.

Using text field events to trigger scripts

You can use ActionScript to capture events that happen to text fields—for example, you can determine whether a user has changed or scrolled the text. You can write ActionScript statements that use these events to trigger scripts to run.

You can capture the following text field events: onChanged and onScroller.

To use a text field event to trigger a script:

1 Assign an instance name to the text field. Do one of the following:

- Use the Text tool to create a text field on the Stage. Assign the text field an instance name in the Property inspector.
- Use ActionScript to create a text field dynamically with the createTextField method. Assign the text field an instance name as a parameter of the createTextField method.

2 In the Actions panel, select the Built-in Classes category in the Actions toolbox, then select the Movie category, then select the TextField category, and then select the Events category. Finally, double-click an event. For this example, use the onChanged method.

3 Replace the placeholder instanceName with the actual instance name of the text field.

4 Add ActionScript statements inside the function. These statements run when the text field is changed.

About using Cascading Style Sheets (CSS) with text fields

You can attach style sheets to text fields to control text formatting. Flash supports a subset of CSS tags. You attach a style sheet to a text file using the TextField.StyleSheet object. See "Creating a style sheet object" in ActionScript Reference Guide Help.

Creating scrolling text

You can use the scroll and maxscroll properties of the TextField object to control vertical scrolling and the hscroll and maxhscroll properties to control horizontal scrolling in a text block. The scroll and hscroll properties contain a number that specifies the topmost visible line in a text block; you can read and write these properties. The maxscroll and maxhscroll properties contain a number that specifies the topmost visible line in a text block when the bottom line of the text is visible in the text block; you can only read these properties.

To use the scroll property to create scrolling text:

1 Assign an instance name to the text field that will contain scrolling text. Do one of the following:

   - Use the Text tool to create a text field on the Stage. Assign the text field an instance name in the Property inspector.

   - Use ActionScript to create a text field dynamically with the `createTextField` method. Assign the text field an instance name as a parameter of the `createTextField` method.

2 Create an Up button and a Down button or select Window > Other Panels > Common Libraries > Buttons and drag buttons to the Stage. You will use these buttons to scroll the text up and down.

3 Select the Up button on the Stage.

4 In the Actions panel, select the Built-in Classes category, then select the Movie category, then select the TextField category, and then select the Properties category. Finally, double-click the `scroll` property to add it to the Script pane.

5 Replace `instanceName` with the instance name of the text field you want to scroll.

6 Increment the scroll property by 1 to scroll the text up. The code should look like this:

```
instName.scroll += 1;
```

7 Select the Down button on the Stage.

8 Repeat steps 4 and 5.

9 Decrement the scroll property by 1 to scroll the text down. The code should look like this:

```
instName.scroll -= 1;
```

CHAPTER 7
Using Imported Artwork

Macromedia Flash MX 2004 and Macromedia Flash MX Professional 2004 can use artwork created in other applications. You can import vector graphics and bitmaps in a variety of file formats. If you have QuickTime 4 or later installed on your system, you can import additional vector or bitmap file formats. For more information, see "Importing file formats for vector or bitmap files" on page 122. You can import Macromedia FreeHand files (version MX and earlier) and Macromedia Fireworks PNG files directly into Flash, preserving attributes from those formats.

When you import a bitmap, you can apply compression and anti-aliasing, place the bitmap directly in a Flash document, use the bitmap as a fill, edit the bitmap in an external editor, break the bitmap apart into pixels and edit it in Flash, or convert the bitmap to vector artwork. See "Working with imported bitmaps" on page 127.

You can also import video into Flash. See Chapter 10, "Working with Video," on page 163.

For information on importing sound files in WAV (Windows), AIFF (Macintosh), and MP3 (both platforms) formats, see Chapter 11, "Working with Sound," on page 185.

Placing artwork into Flash

Flash recognizes a variety of vector and bitmap formats. You can place artwork into Flash by importing it onto the Stage in the current Flash document or into the library for the current document. You can also import bitmaps by pasting them on the Stage in the current document. All bitmaps that you import directly into a Flash document are automatically added to the document's library.

Graphic files that you import into Flash must be at least 2 pixels x 2 pixels in size.

You can load JPEG files into a Flash movie during runtime using the loadMovie action or method. For detailed information, see loadMovie() in ActionScript Dictionary Help.

Flash imports vector graphics, bitmaps, and sequences of images as follows:

- When you import vector images into Flash from FreeHand, you can select options for preserving FreeHand layers, pages, and text blocks. See "Importing FreeHand MX files" on page 124.

- When you import PNG images from Fireworks, you can import files as editable objects that you can modify in Flash, or as flattened files that you can edit and update in Fireworks.

- You can select options for preserving images, text, and guides. See "Importing Fireworks PNG files" on page 123.

  Note: If you import a PNG file from Fireworks by cutting and pasting, the file is converted to a bitmap.

- When you import Adobe Illustrator, EPS, or PDF files into Flash, you can select options for converting pages and layers. You can choose to rasterize all content, including text. See "Importing Adobe Illustrator, EPS, or PDF files" on page 125.

- Vector images from SWF and Windows Metafile Format (WMF) files that you import directly into a Flash document (instead of into a library) are imported as a group in the current layer. See "Importing file formats for vector or bitmap files" on page 122 and "Importing Adobe Illustrator, EPS, or PDF files" on page 125.

- Bitmaps (scanned photographs, BMP files) that you import directly into a Flash document are imported as single objects in the current layer. Flash preserves the transparency settings of imported bitmaps. Because importing a bitmap can increase the file size of a SWF file, you may want to compress imported bitmaps. See "Setting bitmap properties" on page 128.

  Note: Bitmap transparency may not be preserved when bitmaps are imported by dragging and dropping from an application or desktop to Flash. To preserve transparency, use the File > Import to Stage or Import to Library command for importing.

- Any sequence of images (for example, a PICT and BMP sequence) that you import directly into a Flash document is imported as successive keyframes of the current layer.

For information on specific file formats, see "Importing file formats for vector or bitmap files" on page 122.

To import a file into Flash:

1 Do one of the following:

- To import a file directly into the current Flash document, select File > Import to Stage.

- To import a file into the library for the current Flash document, select File > Import to Library. (To use a library item in a document, drag it onto the Stage. See Chapter 3, "Using Symbols, Instances, and Library Assets," on page 47.)

2 In the Import dialog box, select a file format from the Files of Type (Windows) or Show (Macintosh) pop-up menu.

3 Navigate to the desired file and select it.

If an imported file has multiple layers, Flash may create new layers (depending on the import file type). Any new layers will be displayed in the Timeline.

Note: If you are importing a Fireworks PNG file, see "Importing Fireworks PNG files" on page 123. If you are importing a FreeHand file, see "Importing FreeHand MX files" on page 124. If you are importing an Adobe Illustrator file, see "Importing Adobe Illustrator, EPS, or PDF files" on page 125.

4 Click Open.

5 If the name of the file you are importing ends with a number, and there are additional sequentially numbered files in the same folder, select whether to import the sequence of files.

- Click Yes to import all the sequential files.

- Click No to import only the specified file.

The following are examples of filenames that can be used as a sequence:

Frame001.gif, Frame002.gif, Frame003.gif

Bird 1, Bird 2, Bird 3

Walk-001.ai, Walk-002.ai, Walk-003.ai

To paste a bitmap from another application directly into the current Flash document:

1 Copy the image in the other application.

2 In Flash, select Edit > Paste in Center or Edit > Paste in Place.

Importing file formats for vector or bitmap files

Flash can import different vector or bitmap file formats depending on whether QuickTime 4 or later is installed on your system. Using Flash with QuickTime 4 installed is especially useful for collaborative projects in which authors work on both Windows and Macintosh platforms. QuickTime 4 extends support for certain file formats (including Adobe Photoshop, PICT, QuickTime Movie, and others) to both platforms.

The following vector or bitmap file formats can be imported into Flash MX 2004, regardless of whether QuickTime 4 is installed:

File type	Extension	Windows	Macintosh
Adobe Illustrator (version 10 or earlier; see "Importing Adobe Illustrator, EPS, or PDF files" on page 125)	.eps, .ai .pdf	✔	✔
AutoCAD DXF (see "AutoCAD DXF files" on page 127)	.dxf	✔	✔
Bitmap	.bmp	✔	✔ (Using QuickTime)
Enhanced Windows Metafile	.emf	✔	
FreeHand	.fh7, .fh8, .fh9, .fh10, .fh11	✔	✔
FutureSplash Player	.spl	✔	✔
GIF and animated GIF	.gif	✔	✔
JPEG	.jpg	✔	✔
PNG	.png	✔	✔
Flash Player 6/7	.swf	✔	✔
Windows Metafile	.wmf	✔	✔

The following bitmap file formats can be imported into Flash only if QuickTime 4 or later is installed:

File type	Extension	Windows	Macintosh
MacPaint	.pntg	✔	✔
Photoshop	.psd	✔	✔
PICT	.pct, .pic	✔ (As bitmap)	✔
QuickTime Image	.qtif	✔	✔
Silicon Graphics Image	.sgi	✔	✔
TGA	.tga	✔	✔
TIFF	.tif	✔	✔

Importing Fireworks PNG files

You can import Fireworks PNG files into Flash as flattened images or as editable objects. When you import a PNG file as a flattened image, the entire file (including any vector artwork) is *rasterized*, or converted to a bitmap image. When you import a PNG file as editable objects, vector artwork in the file is preserved in vector format. You can choose to preserve placed bitmaps, text, and guides in the PNG file when you import it as editable objects.

If you import the PNG file as a flattened image, you can start Fireworks from within Flash and edit the original PNG file (with vector data). See "Editing bitmaps in an external editor" on page 129.

When you import multiple PNG files in a batch, you select import settings one time. Flash uses the same settings for all files in the batch.

Note: You can edit bitmap images in Flash by converting the bitmap images to vector artwork or by breaking apart the bitmap images. See "Converting bitmaps to vector graphics" on page 131 and "Breaking apart a bitmap" on page 130.

To import a Fireworks PNG file:

1 Select File > Import to Stage or Import to Library.

2 In the Import dialog box, select PNG Image from the Files of Type (Windows) or Show (Macintosh) pop-up menu.

3 Navigate to a Fireworks PNG image and select it.

4 Click Open.

5 In the Fireworks PNG Import Settings dialog box, select one of the following for File Structure:

Import as Movie Clip and Retain Layers imports the PNG file as a movie clip, with all of its frames and layers intact inside the movie clip symbol.

Import into New Layer in Current Scene imports the PNG file into the current Flash document in a single new layer at the top of the stacking order. The Fireworks layers are flattened into the single layer. The Fireworks frames are contained in the new layer.

6 For Objects, select one of the following:

Rasterize if Necessary to Maintain Appearance preserves Fireworks fills, strokes, and effects in Flash.

Keep All Paths Editable keeps all objects as editable vector paths. Some Fireworks fills, strokes, and effects are lost on import.

7 For Text, select one of the following:

Rasterize if Necessary to Maintain Appearance preserves Fireworks fills, strokes, and effects in text imported into Flash.

Keep All Paths Editable keeps all text editable. Some Fireworks fills, strokes, and effects are lost on import.

8 Select Import as a Single Flattened Image to flatten the PNG file into a single bitmap image. When this option is selected, all other options are dimmed.

9 Click OK.

Importing FreeHand MX files

You can import FreeHand files in version 7 or later directly into Flash. FreeHand MX is the best choice for creating vector graphics for import into Flash, because you can preserve FreeHand layers, text blocks, library symbols, and pages, and choose a page range to import. If the imported FreeHand file is in CMYK color mode, Flash converts the file to RGB.

Keep the following guidelines in mind when importing FreeHand files:

- When importing a file with overlapping objects that you want to preserve as separate objects, place the objects on separate layers in FreeHand, and select Layers in the FreeHand Import dialog box in Flash when importing the file. (If overlapping objects on a single layer are imported into Flash, the overlapping shapes will be divided at intersection points, just as with overlapping objects that you create in Flash.)

- When you import files with gradient fills, Flash can support up to eight colors in a gradient fill. If a FreeHand file contains a gradient fill with more than eight colors, Flash creates clipping paths to simulate the appearance of a gradient fill. Clipping paths can increase file size. To minimize file size, use gradient fills with eight colors or fewer in FreeHand.

- When you import files with blends, Flash imports each step in a blend as a separate path. Thus, the more steps a blend has in a FreeHand file, the larger the imported file size will be in Flash.

- When you import files with strokes that have square caps, Flash converts the caps to round caps.

- When you import files with placed grayscale images, Flash converts the grayscale images to RGB images. This conversion can increase the imported file's size.

- When importing files with placed EPS images, you must select the Convert Editable EPS when Imported option in FreeHand Import Preferences before you place the EPS into FreeHand. If you do not select this option, the EPS image will not be viewable when imported into Flash. In addition, Flash does not display information for an imported EPS image (regardless of the Preferences settings used in FreeHand).

To import a FreeHand file:

1 Select File > Import to Stage or File > Import to Library.

2 In the Import dialog box, select FreeHand from the Files of Type (Windows) or Show (Macintosh) pop-up menu.

3 Navigate to a FreeHand file and select it.

4 Click Open.

5 In the FreeHand Import Settings dialog box, for Mapping Pages, select a setting:

   Scenes converts each page in the FreeHand document to a scene in the Flash document.

   Keyframes converts each page in the FreeHand document to a keyframe in the Flash document.

6 For Mapping Layers, select one of the following:

   Layers converts each layer in the FreeHand document to a layer in the Flash document.

   Keyframes converts each layer in the FreeHand document to a keyframe in the Flash document.

   Flatten converts all layers in the FreeHand document to a single flattened layer in the Flash document.

7 For Pages, do one of the following:

   ■ Select All to import all pages from the FreeHand document.

   ■ Enter page numbers for From and To to import a page range from the FreeHand document.

8 For Options, select any of the following options:

   Include Invisible Layers imports all layers (visible and hidden) from the FreeHand document.

   Include Background Layer imports the background layer with the FreeHand document.

   Maintain Text Blocks preserves text in the FreeHand document as editable text in the Flash document.

9 Click OK.

Importing Adobe Illustrator, EPS, or PDF files

Flash can import Adobe Illustrator files in version 6 or later, EPS files in any version, and PDF files in version 1.4 or earlier.

Note: The PDF version number is different from the Adobe Acrobat number. Adobe Acrobat is a product used to author PDF files. PDF is the file format.

When you import an Illustrator file into Flash, you must ungroup all the Illustrator objects on all layers. Once all the objects are ungrouped, they can be manipulated like any other Flash object. You can also export Flash documents as Adobe Illustrator files. For information on exporting Illustrator files, see "Adobe Illustrator" on page 313.

You can choose from the following options when importing Adobe Illustrator, EPS, or PDF files:

- Convert pages to scenes or keyframes.
- Convert layers to Flash layers or keyframes or flatten all layers.
- Select which pages to import.
- Include invisible layers.
- Maintain text blocks.
- Rasterize everything. Choosing this option flattens layers and rasterizes text, and disables options for converting layers or maintaining text blocks.

To import an Adobe Illustrator, EPS, or PDF file:

1 Select File > Import to Stage or Import to Library.

2 In the Import dialog box, select Adobe Illustrator, EPS, or PDF from the Files of Type (Windows) or Show (Macintosh) pop-up menu.

3 Navigate to a file and select it.

4 Click Open.

   The Import Options dialog box appears.

5 For Convert Pages, select one of the following:

   Screens (in screens mode) or **Scenes** (in scenes mode) converts each page to a screen or a scene.

   Keyframes converts each page to a keyframe.

6 For Convert Layers, select one of the following:

   Layers converts each layer in the imported document to a layer in the Flash document.

   Keyframes converts each layer in the imported document to a keyframe in the Flash document.

   Flatten converts all layers in the imported document to a single flattened layer in the Flash document.

7 For Which Pages to Import, select All to import all pages, or select From and enter a page range to import.

8 For Options, select any of the following:

   Include Invisible Layers imports all layers (visible and hidden) from the imported document.

   Maintain Text Blocks imports text as editable text in Flash.

   Rasterize Everything converts all content in the imported document to bitmaps. Enter a value to set the resolution for the imported document. Selecting this option flattens all layers and disables the Maintain Text Blocks option.

9 Click OK.

AutoCAD DXF files

Flash supports the AutoCAD DXF format in the release 10 version.

DXF files do not support the standard system fonts. Flash tries to map fonts appropriately, but the results can be unpredictable, particularly for the alignment of text.

Since the DXF format does not support solid fills, filled areas are exported as outlines only. For this reason, the DXF format is most appropriate for line drawings, such as floor plans and maps.

You can import two-dimensional DXF files into Flash. Flash does not support three-dimensional DXF files.

Although Flash doesn't support scaling in a DXF file, all imported DXF files produce 12-inch x 12-inch files that you can scale using the Modify > Transform > Scale command. Also, Flash supports only ASCII DXF files. If your DXF files are binary, you must convert them to ASCII before importing them into Flash.

Working with imported bitmaps

When you import a bitmap into Flash, you can modify that bitmap and use it in your Flash document in a variety of ways. You can apply compression and anti-aliasing to imported bitmaps to control the size and appearance of bitmaps in your Flash applications. See "Setting bitmap properties" on page 128. You can apply an imported bitmap as a fill to an object. See "Applying a bitmap fill" on page 129.

Flash lets you break apart a bitmap into editable pixels. The bitmap retains its original detail but is broken into discrete areas of color. When you break a bitmap apart, you can select and modify areas of the bitmap with the Flash drawing and painting tools. Breaking apart a bitmap also lets you sample the bitmap with the Eyedropper tool to use it as a fill. See "Breaking apart a bitmap" on page 130.

You can edit an imported bitmap in Fireworks or another external image editor by starting the editing application from within Flash. See "Editing bitmaps in an external editor" on page 129. To convert a bitmap's image to a vector graphic, you can trace the bitmap. Performing this conversion enables you to modify the graphic as you do other vector artwork in Flash. See "Converting bitmaps to vector graphics" on page 131.

If a Flash document displays an imported bitmap at a larger size than the original, the image may be distorted. Preview imported bitmaps to be sure that images are displayed properly.

Using the Property inspector to work with bitmaps

When you select a bitmap on the Stage, the Property inspector displays the bitmap's symbol name and its pixel dimensions and position on the Stage. Using the Property inspector, you can assign a new name to the bitmap, and you can *swap* an instance of a bitmap—that is, replace the instance with an instance of another bitmap in the current document.

To display the Property inspector with bitmap properties:

1 Select an instance of a bitmap on the Stage.

2 Select Window > Properties.

To assign a new name to a bitmap:

1 Select the bitmap in the Library panel.

2 Select Window > Properties if the Property inspector is not visible. Select an instance of the bitmap on the Stage to view the bitmap properties.

3 In the Property inspector, enter a new name in the Name text box.

4 Click OK.

To replace an instance of a bitmap with an instance of another bitmap:

1 Select a bitmap instance on the Stage.

2 Select Window > Properties if the Property inspector is not visible.

3 In the Property inspector, click Swap.

4 In the Swap Bitmap dialog box, select a bitmap to replace the one currently assigned to the instance.

Setting bitmap properties

You can apply anti-aliasing to an imported bitmap to smooth the edges in the image. You can also select a compression option to reduce the bitmap file size and format the file for display on the web.

To select bitmap properties, you use the Bitmap Properties dialog box.

To set bitmap properties:

1 Select a bitmap in the Library panel.

2 Do one of the following:

   - Click the properties icon at the bottom of the Library panel.

   - Right-click (Windows) or Control-click (Macintosh) the bitmap's icon and select Properties from the context menu.

   - Select Properties from the options menu in the upper right corner of the Library panel.

3 In the Bitmap Properties dialog box, select Allow Smoothing to smooth the edges of the bitmap with anti-aliasing.

4 For Compression, select one of the following options:

   Photo (JPEG) compresses the image in JPEG format. To use the default compression quality specified for the imported image, select Use Document Default Quality. To specify a new quality compression setting, deselect Use Document Default Quality and enter a value between 1 and 100 in the Quality text box. (A higher setting preserves greater image integrity but yields a larger file size.)

   Lossless (PNG/GIF) compresses the image with lossless compression, in which no data is discarded from the image.

   Note: Use Photo compression for images with complex color or tonal variations, such as photographs or images with gradient fills. Use Lossless compression for images with simple shapes and relatively few colors.

5 Click Test to determine the results of the file compression. Compare the original file size to the compressed file size to determine if the selected compression setting is acceptable.

6 Click OK.

Note: JPEG Quality settings that you select in the Publish Settings dialog box do not specify a quality setting for imported JPEG files. You must specify a quality setting for imported JPEG files in the Bitmap Properties dialog box.

Applying a bitmap fill

You can apply a bitmap as a fill to a graphic object using the Color Mixer. Applying a bitmap as a fill tiles the bitmap to fill the object. The Fill Transform tool allows you to scale, rotate, or skew an image and its bitmap fill. See "Transforming gradient and bitmap fills" on page 71.

To apply a bitmap as a fill using the Color Mixer:

1 To apply the fill to existing artwork, select a graphic object or objects on the Stage.

2 Select Window > Design Panels > Color Mixer.

3 In the Color Mixer, select Bitmap from the pop-up menu in the center of the panel.

4 If you need a larger preview window to display more bitmaps in the current document, click the arrow in the lower right corner to expand the Color Mixer.

5 Click a bitmap to select it.

The bitmap becomes the current fill color. If you selected artwork in step 1, the bitmap is applied as a fill to the artwork.

Editing bitmaps in an external editor

If you are editing a Fireworks PNG file imported as a flattened image, you can choose to edit the PNG source file for the bitmap, when available.

Note: You cannot edit bitmaps from Fireworks PNG files imported as editable objects in an external image editor.

If you have Fireworks 3 or later or another image-editing application installed on your system, you can start the application from within Flash to edit an imported bitmap.

To edit a bitmap with Fireworks 3 or later:

1 In the Library panel, right-click (Windows) or Control-click (Macintosh) the bitmap's icon.

2 In the bitmap's context menu, select Edit with Fireworks 3.

3 In the Edit Image dialog box, specify whether the PNG source file or the bitmap file is to be opened.

4 Perform the desired modifications to the file in Fireworks.

5 In Fireworks, select File > Update.

6 Return to Flash.

The file is automatically updated in Flash.

To edit a bitmap with another image-editing application:

1 In the Library panel, right-click (Windows) or Control-click (Macintosh) the bitmap's icon.

2 In the bitmap's context menu, select Edit With.

3 Select an image-editing application to open the bitmap file, and click OK.

4 Perform the desired modifications to the file in the image-editing application.

5 Save the file in the image-editing application.

   The file is automatically updated in Flash.

6 Return to Flash to continue editing the document.

Breaking apart a bitmap

Breaking apart a bitmap separates the pixels in the image into discrete areas that can be selected and modified separately. When you break apart a bitmap, you can modify the bitmap with the Flash drawing and painting tools. Using the Lasso tool with the Magic Wand modifier, you can select areas of a bitmap that has been broken apart.

You can paint with a broken-apart bitmap by selecting the bitmap with the Eyedropper tool and applying the bitmap as a fill with the Paint Bucket tool or another drawing tool.

To break apart a bitmap:

1 Select a bitmap in the current scene.

2 Select Modify > Break Apart.

To change the fill of selected areas of a broken-apart bitmap:

1 Select the Lasso tool and click the Magic Wand modifier.

2 Click the Magic Wand Settings modifier and set the following options:

   - For Threshold, enter a value between 1 and 200 to define how closely the color of adjacent pixels must match to be included in the selection. A higher number includes a broader range of colors. If you enter 0, only pixels of the exact same color as the first pixel you click are selected.

   - For Smoothing, select an option from the pop-up menu to define how much the edges of the selection will be smoothed.

3 Click the bitmap to select an area. Continue clicking to add to the selection.

4 Select the fill that you want to use to fill the selected areas in the bitmap. See "Using the Stroke Color and Fill Color controls in the toolbar" on page 67.

5 Select the Paint Bucket tool and click anywhere in the selected area to apply the new fill.

To apply a broken-apart bitmap as a fill using the Eyedropper tool:

1 Select the Eyedropper tool and click the broken-apart bitmap on the Stage.

   The Eyedropper tool sets the bitmap to be the current fill and changes the active tool to the Paint Bucket.

2 Do one of the following:

   - Click an existing graphic object with the Paint Bucket tool to apply the bitmap as a fill.

   - Select the Oval, Rectangle, or Pen tool and draw a new object. The object is filled with the broken-apart bitmap.

   You can use the Paint Bucket tool to scale, rotate, or skew the bitmap fill.

Converting bitmaps to vector graphics

The Trace Bitmap command converts a bitmap into a vector graphic with editable, discrete areas of color. This command lets you manipulate the image as a vector graphic; it is also useful if you want to reduce file size.

When you convert a bitmap to a vector graphic, the vector graphic is no longer linked to the bitmap symbol in the Library panel.

Note: If the imported bitmap contains complex shapes and many colors, the converted vector graphic may have a larger file size than the original bitmap. Try a variety of settings in the Trace Bitmap dialog box to find a balance between file size and image quality.

You can also break apart a bitmap in order to modify the image using Flash drawing and painting tools. See "Breaking apart a bitmap" on page 130.

To convert a bitmap to a vector graphic:

1 Select a bitmap in the current scene.

2 Select Modify > Bitmap > Trace Bitmap.

3 Enter a Color Threshold value between 1 and 500.

   When two pixels are compared, if the difference in the RGB color values is less than the color threshold, the two pixels are considered the same color. As you increase the threshold value, you decrease the number of colors.

4 For Minimum Area, enter a value between 1 and 1000 to set the number of surrounding pixels to consider when assigning a color to a pixel.

5 For Curve Fit, select an option from the pop-up menu to determine how smoothly outlines are drawn.

6 For Corner Threshold, select an option from the pop-up menu to determine whether sharp edges are retained or smoothed out.

   To create a vector graphic that looks most like the original bitmap, enter the following values:

   - Color Threshold: 10

   - Minimum Area: 1 pixel

   - Curve Fit: Pixels

   - Corner Threshold: Many Corners

CHAPTER 8
Working with Graphic Objects

In Macromedia Flash MX 2004 and Macromedia Flash MX Professional 2004, graphic objects are items on the Stage. Flash lets you move, copy, delete, transform, stack, align, and group graphic objects. You can also link a graphic object to a URL. Keep in mind that modifying lines and shapes can alter other lines and shapes on the same layer. See Chapter 5, "Drawing," on page 77.

Note: Graphic objects in Flash are different from ActionScript objects, which are part of the ActionScript programming language. Be careful not to confuse the two uses of the term. For more information on objects in the programming language, see "About data types" in ActionScript Reference Guide Help.

Selecting objects

To modify an object, you must first select it. Flash provides a variety of methods for making selections, including the Selection tool, the Lasso tool, and keyboard commands. You can group individual objects to manipulate them as a single object. See "Grouping objects" on page 135.

Flash highlights objects and strokes that have been selected with a dot pattern. Selected groups are highlighted with bounding boxes in the color used for the outline of the layer that contains the selected group. You can change the layer outline color in the Layer Properties dialog box. See "Using layers" in Getting Started Help.

You can choose to select only an object's strokes or only its fills. You can hide selection highlighting in order to edit objects without viewing highlighting.

When you select an object, the Property inspector displays the object's stroke and fill, its pixel dimensions, and the x and y coordinates of the object's transformation point.

If you select multiple items of different types on the Stage, such as an object, a button, and a movie clip, the Property inspector indicates a mixed selection. The Property inspector for a mixed selection displays the pixel dimensions and x and y coordinates of the selected set of items.

You can use the Property inspector for a shape to change the object's stroke and fill. See Chapter 4, "Working with Color," on page 67.

You might want to prevent a group or symbol from being selected and accidentally changed. To do this, you can lock the group or symbol. See "Modifying selections" on page 134.

Selecting objects with the Selection tool

The Selection tool lets you select entire objects by clicking an object or dragging to enclose the object within a rectangular selection marquee.

Note: To select the Selection tool, you can also press the V key. To temporarily switch to the Selection tool when another tool is active, hold down the Control key (Windows) or Command key (Macintosh).

To select a stroke, fill, group, instance, or text block:

* Select the Selection tool and click the object.

To select connected lines:

* Select the Selection tool and double-click one of the lines.

To select a filled shape and its stroked outline:

* Select the Selection tool and double-click the fill.

To select objects within a rectangular area:

* Select the Selection tool and drag a marquee around the object or objects that you want to select. Instances, groups, and type blocks must be completely enclosed to be selected.

Modifying selections

You can add to selections, select or deselect everything on every layer in a scene, select everything between keyframes, or lock and unlock selected symbols or groups.

To add to a selection:

* Hold down the Shift key while making additional selections.

   Note: To disable the Shift-selecting option, deselect the option in Flash General Preferences. See "Setting preferences in Flash" in Getting Started Help.

To select everything on every layer of a scene:

* Select Edit > Select All, or press Control+A (Windows) or Command+A (Macintosh).

   Select All doesn't select objects on locked or hidden layers, or layers not on the current Timeline.

To deselect everything on every layer:

* Select Edit > Deselect All, or press Control+Shift+A (Windows) or Command+Shift+A (Macintosh).

To select everything on one layer between keyframes:

* Click a frame in the Timeline. For more information, see "Using the Timeline" in Getting Started Help.

To lock a group or symbol:

* Select the group or symbol and select Modify > Arrange > Lock.

   Select Modify > Arrange > Unlock All to unlock all locked groups and symbols.

Selecting objects with the Lasso tool

To select objects by drawing either a freehand or a straight-edged selection area, you can use the Lasso tool and its Polygon Mode modifier. When using the Lasso tool, you can switch between the freeform and straight-edged selection modes.

To select objects by drawing a freehand selection area:

- Select the Lasso tool and drag around the area. End the loop approximately where you started, or let Flash automatically close the loop with a straight line.

To select objects by drawing a straight-edged selection area:

1 Select the Lasso tool and select the Polygon Mode modifier in the Options section of the toolbar.

2 Click to set the starting point.

3 Position the pointer where you want the first line to end, and click. Continue setting end points for additional line segments.

4 To close the selection area, double-click.

To select objects by drawing both freehand and straight-edged selection areas:

1 Select the Lasso tool and deselect the Polygon Mode modifier.

2 To draw a freehand segment, drag on the Stage.

3 To draw a straight-edged segment, Alt-click (Windows) or Option-click (Macintosh) to set start and end points. You can continue switching between drawing freehand and straight-edged segments.

4 To close the selection area, do one of the following:

   - If you are drawing a freehand segment, release the mouse button.
   - If you are drawing a straight-edged segment, double-click.

Hiding selection highlighting

You can hide selection highlights in order to edit objects without viewing their highlighting. Hiding highlights enables you to see how artwork will appear in its final state while you are selecting and editing objects.

To hide selection highlighting:

- Select View > Hide Edges.

   Select the command again to deselect the feature.

Grouping objects

To manipulate elements as a single object, you need to group them. For example, after creating a drawing such as a tree or flower, you might group the elements of the drawing so that you can easily select and move the drawing as a whole.

When you select a group, the Property inspector displays the x and y coordinates of the group and its pixel dimensions.

You can edit groups without ungrouping them. You can also select an individual object in a group for editing, without ungrouping the objects.

To create a group:

1 Select the objects on the Stage that you want to group.

   You can select shapes, other groups, symbols, text, and so on.

2 Select Modify > Group, or press Control+G (Windows) or Command+G (Macintosh).

To ungroup objects:

* Select Modify > Ungroup, or press Control+Shift+G (Windows) or Command+Shift+G (Macintosh).

To edit a group or an object within a group:

1 With the group selected, select Edit > Edit Selected, or double-click the group with the Selection tool.

   Everything on the page that is not part of the group is dimmed, indicating it is inaccessible.

2 Edit any element within the group.

3 Select Edit > Edit All, or double-click a blank spot on the Stage with the Selection tool.

   Flash restores the group to its status as a single entity, and you can work with other elements on the Stage.

Moving, copying, and deleting objects

You can move objects by dragging them on the Stage, cutting and pasting them, using the arrow keys, or using the Property inspector to specify an exact location for them. You can also move objects between Flash and other applications using the Clipboard. You can copy objects by dragging or pasting them, or while transforming them. When you move an object, the Property inspector indicates the new position.

When moving an object with the Selection tool, you can use the Snap modifier for the Selection tool to quickly align the object with points on other objects.

Moving objects

To move an object, you can drag the object, use the arrow keys, use the Property inspector, or use the Info panel.

To move objects by dragging:

1 Select an object or multiple objects.

2 Select the Selection tool, position the pointer over the object, and drag to the new position. To copy the object and move the copy, Alt-drag (Windows) or Option-drag (Macintosh). To constrain the object's movement to multiples of 45°, Shift-drag.

To move objects using the arrow keys:

1 Select an object or multiple objects.

2 Press the arrow key for the direction in which you want the object to move 1 pixel at a time. Press Shift+arrow key to move the selection 10 pixels at a time.

   Note: When Snap to Pixels is selected, the arrow keys move objects by pixel increments on the document's pixel grid, not by pixels on the screen. See "Pixel snapping" on page 92.

To move objects using the Property inspector:

1 Select an object or multiple objects.

2 If the Property inspector is not visible, select Window > Properties.

3 Enter *x* and *y* values for the location of the upper left corner of the selection. The units are relative to the upper left corner of the Stage.

> **Note:** The Property inspector uses the units specified for the Ruler Units option in the Document Properties dialog box. To change the units, see "Creating or opening a document and setting properties" on page 9.

To move objects using the Info panel:

1 Select an object or multiple objects.

2 If the Info Panel is not visible, select Window > Design Panels > Info.

3 Enter *x* and *y* values for the location of the upper left corner of the selection. The units are relative to the upper left corner of the Stage.

Moving and copying objects by pasting

When you need to move or copy objects between layers, scenes, or other Flash files, you should use the pasting technique. You can paste an object in a position relative to its original position.

To move or copy objects by pasting:

1 Select an object or multiple objects.

2 Select Edit > Cut or Edit > Copy.

3 Select another layer, scene, or file and select Edit > Paste in Place to paste the selection in the same position relative to the Stage.

About copying artwork with the Clipboard

Elements copied to the Clipboard are anti-aliased, so they look as good in other applications as they do in Flash. This is particularly useful for frames that include a bitmap image, gradients, transparency, or a mask layer.

Graphics pasted from other Flash documents or programs are placed in the current frame of the current layer. How a graphic element is pasted into a Flash scene depends on the type of element it is, its source, and the preferences you have set:

- Text from a text editor becomes a single text object.

- Vector-based graphics from any drawing program become a group that can be ungrouped and edited like any other Flash element.

- Bitmaps become a single grouped object just like imported bitmaps. You can break apart pasted bitmaps or convert pasted bitmaps to vector graphics.

  For information on converting bitmaps to vector graphics, see "Converting bitmaps to vector graphics" on page 131.

  > **Note:** Before pasting graphics from FreeHand into Flash, set your FreeHand export preferences to convert colors to CMYK and RGB for Clipboard formats.

Copying transformed objects

To create a scaled, rotated, or skewed copy of an object, you can use the Transform panel.

To create a transformed copy of an object:

1 Select an object.

2 Select Window > Design Panels > Transform.

3 Enter scale, rotation, or skew values. See "Scaling objects" on page 142, "Rotating objects" on page 142, and "Skewing objects" on page 143.

4 Click the Create Copy button in the Transform panel (the left button in the lower right corner of the panel).

Deleting objects

Deleting an object removes it from the file. Deleting an instance on the Stage does not delete the symbol from the library.

To delete objects:

1 Select an object or multiple objects.

2 Do one of the following:

- Press Delete or Backspace.
- Select Edit > Clear.
- Select Edit > Cut.
- Right-click (Windows) or Control-click (Macintosh) the object and select Cut from the context menu.

Stacking objects

Within a layer, Flash stacks objects based on the order in which they were created, placing the most recently created object at the top of the stack. The stacking order of objects determines how they appear when they are overlapping.

Drawn lines and shapes always appear below groups and symbols on the stack. To move them up the stack, you must group them or make them into symbols. You can change the stacking order of objects at any time.

Layers also affect the stacking order. Everything on Layer 2 appears on top of everything on Layer 1, and so on. To change the order of layers, drag the layer name in the Timeline to a new position. See "Using layers" in Getting Started Help.

To change the stacking order of an object:

1 Select the object.

2 Use one of the following commands:

- Select Modify > Arrange > Bring to Front or Send to Back to move the object or group to the top or bottom of the stacking order.
- Select Modify > Arrange > Bring Forward or Send Backward to move the object or group up or down one position in the stacking order.

If more than one group is selected, the groups move in front of or behind all unselected groups, while maintaining their order relative to each other.

Transforming objects

You can transform graphic objects, as well as groups, text blocks, and instances, by using the Free Transform tool or the options in the Modify > Transform submenu. Depending on the type of element you select, you can freely transform, rotate, skew, scale, or distort the element. You can change or add to a selection during a transformation operation.

When you transform an object, group, text box, or instance, the Property inspector for that item displays any changes made to the item's dimensions or position.

A bounding box is displayed during transform operations that involve dragging. The bounding box is rectangular (unless it has been modified with the Distort command or the Envelope modifier; see "Distorting objects" on page 141 and "Modifying shapes with the Envelope modifier" on page 141) with its edges initially aligned to the edges of the Stage. Transformation handles are located on each corner and in the middle of each side. As you drag, the bounding box previews the transformations.

Working with the center point during transformations

During a transformation, a transformation point appears at the center of a selected element. The transformation point is initially aligned with the object's center point. You can move the transformation point, and you can return it to its default location.

For scaling, skewing, or rotating graphic objects, groups, and text blocks, the point opposite the point you drag is the point of origin by default. For instances, the transformation point is the point of origin by default. You can move the default point of origin for a transformation.

You can track the location of the transformation point in the Info panel, and in the Property inspector for the graphic object.

To move the transformation point during a transform operation:

- Drag the transformation point.

To realign the transformation point with the element's center point:

- Double-click the transformation point.

To switch the point of origin for a scale or skew transformation:

- Alt-drag (Windows) or Option-drag (Macintosh) during the transformation.

To track the location of the transformation point in the Info panel and Property inspector:

- In the Info panel, click the center square in the coordinate grid to select it.

  The selected square becomes black.

When the center square is selected, the X and Y values to the right of the coordinate grid in the Info panel display the *x* and *y* coordinates of the transformation point. In addition, the X and Y values for the transformation point are displayed in the Property inspector for the symbol.
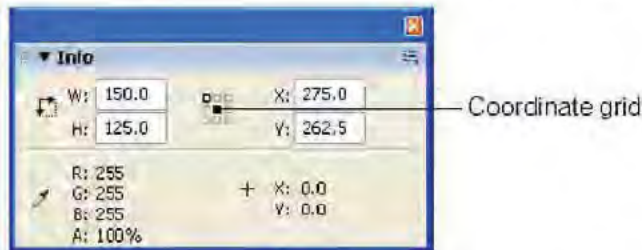
Info panel with center square in coordinate grid selected; x and y coordinates of selection center point displayed

By default, the upper left square in the coordinate grid in the Info panel is selected, and the X and Y values display the location of the upper left corner of the current selection, relative to the upper left corner of the Stage.

Note: For symbol instances, the coordinate grid and the X and Y values display the location of the symbol registration point, or the location of the upper left corner of the symbol instance. See "Editing symbols" on page 53.

Transforming objects freely

You can use the Free Transform tool to freely transform objects, groups, instances, or text blocks. You can perform individual transformations or combine several transformations, such as moving, rotating, scaling, skewing, and distortion.

To transform freely:

1 Select a graphic object, instance, group, or text block on the Stage.

2 Click the Free Transform tool.

   Moving the pointer over and around the selection changes the pointer to indicate which transformation function is available.

3 Drag the handles to transform the selection, as follows:

   - To move the selection, position the pointer over the object within the bounding box, and drag the object to a new position. Do not drag the transformation point.

   - To set the center of rotation or scaling, drag the transformation point to a new location.

   - To rotate the selection, position the pointer just outside a corner handle and drag. The selection rotates around the transformation point.

     Shift-drag to rotate in 45° increments.

     Alt-drag (Windows) or Option-drag (Macintosh) to rotate around the opposite corner.

   - To scale the selection, drag a corner handle diagonally to scale in two dimensions. Drag a corner handle or a side handle horizontally or vertically to scale in the respective direction only. Shift-drag to resize proportionally.

   - To skew the selection, position the pointer on the outline between the transformation handles and drag.

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- To distort shapes, press Control (Windows) or Command (Macintosh) and drag a corner handle or a side handle. Shift-Control-drag (Windows) or Shift-Command-drag (Macintosh) a corner handle to *taper* the object—to move the selected corner and the adjoining corner equal distances from their origins. For more information on distorting objects, see "Distorting objects" on page 141.

Note: The Free Transform tool cannot transform symbols, bitmaps, video objects, sounds, gradients, or text. If a multiple selection contains any of these, only the shape objects are distorted. To transform text, first convert the characters to shape objects.

4 To end the transformation, click outside the selected object, instance, or text block.

Distorting objects

When you apply a Distort transformation to a selected object, dragging a corner handle or an edge handle on the bounding box moves the corner or edge and realigns the adjoining edges. Shift-dragging a corner point *tapers* the object—that is, it moves that corner and the adjoining corner an equal distance and opposite direction from each other. The adjoining corner is the corner opposite the direction you drag. Control-dragging (Windows) or Command-dragging a middle point on an edge moves the entire edge freely.

You can distort graphic objects by using the Distort command. You can also distort objects when freely transforming them. See "Transforming objects freely" on page 140.

To distort graphic objects:

1 Select a graphic object or objects on the Stage.

Note: The Distort command cannot modify symbols, bitmaps, video objects, sounds, gradients, object groups, or text. If a multiple selection contains any of these, only the shape objects are distorted. To modify text, first convert the characters to shape objects.

2 Select Modify > Transform > Distort.

3 Place the pointer on one of the transformation handles and drag.

4 To end the transformation, click outside the selected object or objects.

Modifying shapes with the Envelope modifier

The Envelope modifier lets you warp and distort objects. An envelope is a bounding box that contains one or more objects. Changes made to an envelope's shape affect the shape of the objects contained within the envelope. You edit the shape of an envelope by adjusting its points and tangent handles. See "Adjusting segments" on page 85.

To modify a shape with the Envelope modifier:

1 Select a shape on the Stage.

Note: The Envelope modifier cannot modify symbols, bitmaps, video objects, sounds, gradients, object groups, or text. If a multiple selection contains any of these, only the shape objects are distorted. To modify text, first convert the characters to shape objects.

2 Select Modify > Transform > Envelope.

3 Drag the points and tangent handles to modify the envelope.

Scaling objects

Scaling an object enlarges or reduces the object horizontally, vertically, or both. You can scale an object by dragging or by entering values in the Transform panel.

To scale objects by dragging:

1 Select a graphic object or objects on the Stage.

2 Select Modify > Transform > Scale.

3 Do one of the following:

■ To scale the object both horizontally and vertically, drag one of the corner handles. Proportions are maintained as you scale. Shift-drag to scale nonuniformly.
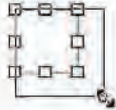
■ To scale the object either horizontally or vertically, drag a center handle.

4 To end the transformation, click outside the selected object or objects.

Note: When you increase the size of a number of items, those near the edges of the bounding box might be moved off the Stage. If this occurs, select View > Work Area to see the elements that are beyond the edges of the Stage.

Rotating objects

Rotating an object turns it around its transformation point. The transformation point is aligned with the registration point, which defaults to the center of the object, but you can move the point by dragging it. You can rotate an object by using the Rotate commands, by dragging with the Free Transform tool, or by specifying an angle in the Transform panel. When you rotate an object by dragging, you can also skew and scale the object in the same operation. When you rotate an object using the Transform panel, you can scale the object in the same operation.

To rotate and skew objects by dragging:

1 Select the object or objects on the Stage.

2 Select Modify > Transform > Rotate and Skew.

3 Do one of the following:

■ Drag a corner handle to rotate the object.

■ Drag a center handle to skew the object.

4 To end the transformation, click outside the selected object or objects.

To rotate objects by 90°:

1 Select the object or objects.

2 Select Modify > Transform > Rotate 90° CW to rotate clockwise, or Rotate 90° CCW to rotate counterclockwise.

Skewing objects

Skewing an object transforms it by slanting it along one or both axes. You can skew an object by dragging or by entering a value in the Transform panel. To skew an object by dragging, see the procedure for rotating and skewing an object by dragging, under "Rotating objects" on page 142.

To skew an object using the Transform panel:

1   Select the object or objects.

2   Select Window > Design Panels > Transform.

3   Click Skew.

4   Enter angles for the horizontal and vertical values.

Flipping objects

You can flip objects across their vertical or horizontal axis without moving their relative position on the Stage.

To flip an object:

1   Select the object.

2   Select Modify > Transform > Flip Vertical or Flip Horizontal.

Restoring transformed objects

When you scale, rotate, and skew instances, groups, and type with the Transform panel, Flash saves the original size and rotation values with the object. This allows you to remove the transformations you applied and restore the original values.

You can undo only the most recent transformation performed in the Transform panel by choosing Edit > Undo. You can reset all transformations performed in the Transform panel by clicking the Reset button in the panel before you deselect the object.

To restore a transformed object to its original state:

1   Select the transformed object.

2   Select Modify > Transform > Remove Transform.

To reset a transformation performed in the Transform panel:

•   With the transformed object still selected, click the Reset button in the Transform panel.

Aligning objects

The Align panel enables you to align selected objects along the horizontal or vertical axis. You can align objects vertically along the right edge, center, or left edge of the selected objects, or horizontally along the top edge, center, or bottom edge of the selected objects. Edges are determined by the bounding boxes enclosing each selected object.

Using the Align panel, you can distribute selected objects so that their centers or edges are evenly spaced. You can resize selected objects so that the horizontal or vertical dimensions of all objects match those of the largest selected object. You can also align selected objects to the Stage. You can apply one or more Align options to selected objects.

To align objects:

1 Select the objects to align.

2 Select Window > Design Panels > Align.

3 In the Align panel, select To Stage to apply alignment modifications relative to stage dimensions.

4 Select alignment buttons to modify the selected objects:

- For Align, select Align Left, Align Horizontal Center, Align Right, Align Top, Align Vertical Center, or Align Bottom.

- For Distribute, select Distribute Top, Distribute Horizontal Center, Distribute Bottom, Distribute Left, Distribute Vertical Center, or Distribute Right.

- For Match Size, select Match Width, Match Height, or Match Width and Height.

- For Space, select Space Horizontally or Space Vertically.

Breaking apart groups and objects

To separate groups, instances, and bitmaps into ungrouped, editable elements, you use the Break Apart command. Breaking apart significantly reduces the file size of imported graphics.

Although you can select Edit > Undo immediately after breaking apart a group or object, breaking apart is not entirely reversible. It affects objects as follows:

- It severs a symbol instance's link to its master symbol.
- It discards all but the current frame in an animated symbol.
- It converts a bitmap to a fill.
- It places each character into a separate text block when applied to text blocks.
- It converts characters to outlines when applied to a single text character. See "Breaking text apart" on page 109.

The Break Apart command should not be confused with the Ungroup command. The Ungroup command separates grouped objects, returning grouped elements to the state they were in prior to grouping. It does not break apart bitmaps, instances, or type, or convert type to outlines.

To break apart groups or objects:

1 Select the group, bitmap, or symbol that you want to break apart.

2 Select Modify > Break Apart.

Note: Breaking apart animated symbols, or groups within an interpolated animation, is not recommended and might have unpredictable results. Breaking apart complex symbols and large blocks of text can take a long time. You might need to increase the application's memory allocation to properly break apart complex objects.

CHAPTER 9
Creating Motion

Macromedia Flash MX 2004 and Macromedia Flash MX Professional 2004 offer several ways to include animation and special effects in your document. Timeline effects, such as blur, expand, and explode, make it easy to animate an object: you can simply select the object, then select an effect and specify parameters. With Timeline effects, you can accomplish in a few easy steps a previously time-consuming task that required more advanced knowledge of animation.

To create tweened animation, you create starting and ending frames and let Flash create the animation for the frames in between. Flash varies the object's size, rotation, color, or other attributes between the starting and ending frames to create the appearance of movement. See "Tweened animation" on page 149.

You can also create animation by changing the contents of successive frames in the Timeline. You can make an object move across the Stage, increase or decrease its size, rotate, change color, fade in or out, or change shape. Changes can occur independently of, or in concert with, other changes. For example, you can make an object rotate and fade in as it moves across the Stage. In frame-by-frame animation, you create the image in every frame. See "Frame-by-frame animation" on page 149.

Using Timeline effects

Flash includes prebuilt Timeline effects that allow you to create complex animations with a minimal number of steps. You can apply Timeline effects to the following objects:

* Text
* Graphics, including shapes, groups, and graphic symbols
* Bitmap images
* Button symbols

Note: When you apply a Timeline effect to a movie clip, Flash nests the effect within the movie clip.

Adding a Timeline effect

When you add a Timeline effect to an object, Flash creates a layer and transfers the object to the new layer. The object is placed inside the effect graphic, and all tweens and transformations required for the effect reside in the graphic on the newly created layer.

The new layer automatically receives the same name as the effect, appended with a number that represents the order in which the effect is applied, out of all effects in your document.

When you add a Timeline effect, a folder with the effect's name is added to the library, containing elements used in creating the effect.

To add an effect to an object:

1 Do one of the following to add a Timeline effect:

- Select the object to which you're adding the Timeline effect. Select Insert > Timeline Effects. Then select Assistants, Effects, or Transition/Transform from the submenu, and select an effect from the list.

- Right-click (Windows) or Control-click (Macintosh) the object to which you're adding the Timeline effect. From the context menu, select Timeline Effects. Then select Assistants, Effects, or Transition/Transform from the submenu, and select an effect from the list.

Effects available for the type of object you've selected appear as active menu choices.

2 In the dialog box that appears for the effect, view the effect preview based on default settings. Modify the default settings as desired, and then click Update Preview to view the effect with the new settings. For more information, see the next section.

3 When the Timeline effect appears as desired in the preview window, click OK.

Timeline effect settings

Each Timeline effect manipulates a graphic or symbol in a specific way and allows you to change individual parameters for a desired effect. In the preview window, you can quickly see the changes made when you alter settings.

Motion effect name and description	Settings
Copy to grid	
Duplicates a selected object by the number of columns and then multiplies the columns by the number of rows to create a grid of the elements.	• Number of rows • Number of columns • Distance between rows, in pixels • Distance between columns, in pixels
Distributed duplication	
Duplicates a selected object the number of times entered in the settings. The first element is a copy of the original object. The objects are modified in increments until the final object reflects the parameters entered in the settings.	• Number of copies • Offset distance, x position, in pixels • Offset distance, y position, in pixels • Offset rotation, in degrees • Offset start frame, in frames across Timeline • Exponential scaling by x, y scale, in delta percentage • Linear scaling by x, y scale, in delta percentage • Final alpha, in percentage • Change color, select/deselect • Final color, in RGB hex value (final copy has this color value; intermediate copies gradually transition to it) • Duplication delay, in frames (results in pause between copies)
Blur	
Creates a motion blur effect by changing the alpha value, position, or scale of an object over time.	• Effect duration, in frames • Allow horizontal blur • Allow vertical blur • Direction of blur • Number of steps • Starting scale
Drop shadow	
Creates a shadow below the selected element.	• Color, in hex RGB value • Alpha transparency, in percentage • Shadow offset, in x, y offset in pixels
Expand	
Expands, contracts, or expands and contracts objects over time. This effect works best with two or more objects grouped together or combined in a movie clip or graphic symbol. Objects containing text or letters work well with this effect.	• Expand duration, in frames • Expand, squeeze, both • Expand direction, to left, from center, to right • Fragment offset, in pixels • Shift group center by, x, y offset, in pixels • Change fragment size by, height, width, in pixels

Motion effect name and description	Settings
Explode	
Gives the illusion of an object exploding. Elements of text or a complex group of objects (symbols, shapes or video clips) break apart, spin, and arc outward.	• Effect duration, in frames • Direction of explosion, upward to left, center, or right, downward to left, center, or right • Arc size, x, y offset in pixels • Rotate fragments by, in degrees • Change fragments size by, in degrees • Final alpha, in percentage
Transform	
Adjusts the position, scale, rotation, alpha, and tint of the selected elements. Use Transform to apply a single effect or a combination of effects to create Fade In/Out, Fly In/Out, Grow/Shrink, and Spin Left/Right effects.	• Effect duration, in frames • Move to position, x, y offset, in pixels • Change position by, x, y offset, in pixels • Scale, lock to equally apply change, in percentage, unlock to apply x and/or y axis change separately, in percentage • Rotate, in degrees • Spin, number of times • Times, counterclockwise, clockwise • Change color, select/deselect • Final color, in RGB hex value • Final alpha, in percentage • Motion ease
Transition	
Wipes in or wipes out selected objects by fading, wiping, or a combination of both.	• Effect duration, in frames • Direction, toggle between in (coming in) and out (going out), select up, down, left, or right • Fade, select/deselect • Wipe, select/deselect • Motion ease

Editing a Timeline effect

You can edit Timeline effects using the Effect Settings dialog box.

To edit a Timeline effect:

1 Select the object associated with the effect on the Stage.

2 To open the Effect Settings dialog box, do one of the following:

   ▪ In the Property inspector, click Edit.

   ▪ Right-click (Windows) or Control-click (Macintosh) the object and select Timeline Effects > Edit Effect from the context menu.

3 In the Effect Settings dialog box, edit the settings as desired, and then click OK.

Deleting a Timeline effect

You use the context menu to delete Timeline effects.

To delete a Timeline effect:

- On the Stage, right-click (Windows) or Control-click (Macintosh) the object that has the Timeline effect that you wish to remove, and select Timeline Effects > Remove Effect from the context menu.

Tweened animation

Flash can create two types of tweened animation, *motion tweening* and *shape tweening*.

- In motion tweening, you define properties such as position, size, and rotation for an instance, group, or text block at one point in time, and then you change those properties at another point in time. You can also apply a motion tween along a path. See "Tweening instances, groups, and type" on page 152 and "Tweening motion along a path" on page 155.
- In shape tweening, you draw a shape at one point in time, and then you change that shape or draw another shape at another point in time. Flash interpolates the values or shapes for the frames in between, creating the animation. See "Tweening shapes" on page 156.

Tweened animation is an effective way to create movement and changes over time while minimizing file size. In tweened animation, Flash stores only the values for the changes between frames.

To quickly prepare elements in a document for tweened animation, distribute objects to layers. See "Distributing objects to layers" on page 152.

You can apply tweened animation to an object on a mask layer to create a dynamic mask. For information on mask layers, see "Using mask layers" on page 160.

Frame-by-frame animation

Frame-by-frame animation changes the contents of the Stage in every frame and is best suited to complex animation in which an image changes in every frame instead of simply moving across the Stage. Frame-by-frame animation increases file size more rapidly than tweened animation. In frame-by-frame animation, Flash stores the values for each complete frame. For information on frame-by-frame animations, see "Creating frame-by-frame animations" on page 158.

Layers in animation

Each scene in a Flash document can consist of any number of layers. As you animate, you use layers and layer folders to organize the components of an animation sequence and to separate animated objects so they don't erase, connect, or segment each other. If you want Flash to tween the movement of more than one group or symbol at once, each must be on a separate layer. Typically, the background layer contains static artwork, and each additional layer contains one separate animated object.

When a document has several layers, tracking and editing the objects on one or two of them can be difficult. This task is easier if you work with the contents of one layer at a time. Layer folders help you organize layers into manageable groups that you can expand and collapse to view only the layers relevant to your current task. See "Using Layers" in Getting Started Help.

Creating keyframes

A keyframe is a frame where you define changes in the animation. When you create frame-by-frame animation, every frame is a keyframe. In tweened animation, you define keyframes at significant points in the animation and let Flash create the contents of frames in between. Flash displays the interpolated frames of a tweened animation as light blue or light green with an arrow drawn between keyframes. Because Flash documents save the shapes in each keyframe, you should create keyframes only at those points in the artwork where something changes.

Keyframes are indicated in the Timeline: a keyframe with content on it is represented by a solid circle, and an empty keyframe is represented by an empty circle before the frame. Subsequent frames that you add to the same layer have the same content as the keyframe.

To create a keyframe, do one of the following:

• Select a frame in the Timeline and select Insert > Timeline > Keyframe.

• Right-click (Windows) or Control-click (Macintosh) a frame in the Timeline and select Insert Keyframe.

Representations of animations in the Timeline

Flash distinguishes tweened animation from frame-by-frame animation in the Timeline as follows:

• Motion tweens are indicated by a black dot at the beginning keyframe; intermediate tweened frames have a black arrow with a light blue background.

• Shape tweens are indicated by a black dot at the beginning keyframe; intermediate frames have a black arrow with a light green background.

• A dashed line indicates that the tween is broken or incomplete, such as when the final keyframe is missing.

• A single keyframe is indicated by a black dot. Light gray frames after a single keyframe contain the same content with no changes and have a black line with a hollow rectangle at the last frame of the span.

• A small *a* indicates that the frame has been assigned a frame action with the Actions panel.

• A red flag indicates that the frame contains a label or comment.

• A gold anchor indicates that the frame is a named anchor.

Frame rates

The frame rate, the speed at which the animation is played, is measured in number of frames per second. A frame rate that's too slow makes the animation appear to stop and start; a frame rate that's too fast blurs the details of the animation. A frame rate of 12 frames per second (fps) usually gives the best results on the web. QuickTime and AVI movies generally have a frame rate of 12 fps, while the standard motion-picture rate is 24 fps.

The complexity of the animation and the speed of the computer on which the animation is being played affect the smoothness of the playback. Test your animations on a variety of machines to determine optimum frame rates.

Because you specify only one frame rate for the entire Flash document, it's a good idea to set this rate before you begin creating animation. See "Creating or opening a document and setting properties" on page 9.

Extending still images

When you create a background for animation, it's often necessary that a still image remain the same for several frames. Adding a span of new frames (not keyframes) to a layer extends the contents of the last keyframe in all the new frames.

To extend a still image through multiple frames:

1 Create an image in the first keyframe of the sequence.

2 Select a frame to the right, marking the end of the span of frames that you want to add.

3 Select Insert > Timeline > Frame.

To use a shortcut to extend still images:

1 Create an image in the first keyframe.

2 Alt-drag (Windows) or Option-drag (Macintosh) the keyframe to the right. This creates a span of new frames, but without a new keyframe at the end point.

Distributing objects to layers for tweened animation

You can quickly distribute selected objects in a frame to separate layers to apply tweened animation to the objects. The objects can be on one or more layers initially. Flash distributes each object to a new, separate layer. Any objects that you don't select (including objects in other frames) are preserved in their original positions.

You can apply the Distribute to Layers command to any type of element on the Stage, including graphic objects, instances, bitmaps, video clips, and broken-apart text blocks.

Applying the Distribute to Layers command to broken-apart text makes it easy to create animated text. The characters in the text are placed in separate text blocks during the Break Apart operation, and each text block is placed on a separate layer during the Distribute to Layers process. For information on breaking text apart, see "Breaking text apart" on page 109.

New layers

New layers created during the Distribute to Layers operation are named according to the name of the element that each contains:

- A new layer containing a library asset (such as a symbol, bitmap, or video clip) is given the same name as the asset.
- A new layer containing a named instance is given the name of the instance.
- A new layer containing a character from a broken-apart text block is named with the character.
- A new layer containing a graphic object (which has no name) is named Layer1 (or Layer2, and so on), because graphic objects do not have names.

Flash inserts new layers below any selected layers in the Timeline. The new layers are arranged top to bottom, in the order in which the selected elements were originally created. For broken-apart text, the layers are arranged in the order of the characters, whether left-to-right, right-to-left, or top-to-bottom. For example, if you break apart the text *FLASH* and distribute it to layers, the new layers, named F, L, A, S, and H, are arranged top to bottom, immediately below the layer initially containing the text.

Distributing objects to layers

To distribute objects to layers, you select the objects in one or more layers and select Distribute to Layers from the Modify menu or from the context menu.

To tween distributed objects, follow the procedure in "Tweening instances, groups, and type" on page 152 or "Tweening shapes" on page 156.

To distribute objects to layers:

1 Select the objects that you want to distribute to layers. The objects can be in a single layer, or in several layers, including noncontiguous layers.
2 Do one of the following:

- Select Modify > Timeline > Distribute to Layers.
- Right-click (Windows) or Control-click (Macintosh) one of the selected objects and select Distribute to Layers from the context menu.

Tweening instances, groups, and type

To tween the changes in properties of instances, groups, and type, you use motion tweening. Flash can tween position, size, rotation, and skew of instances, groups, and type. Additionally, Flash can tween the color of instances and type, creating gradual color shifts or making an instance fade in or out. To tween the color of groups or type, you must make them into symbols. See "Creating symbols" on page 48. To animate individual characters in a block of text separately, you place each character in a separate text block; see "Breaking text apart" on page 109.

If you apply a motion tween and then change the number of frames between the two keyframes, or move the group or symbol in either keyframe, Flash automatically tweens the frames again.

You can create a motion tween using one of two methods:

- Create the starting and ending keyframes for the animation and use the Motion Tweening option in the Property inspector.
- Create the first keyframe for the animation, insert the number of frames you want on the Timeline, select Insert > Timeline > Create Motion Tween, and move the object to the new location on the Stage. Flash automatically creates the ending keyframe.

When tweening position, you can make the object move along a nonlinear path. See "Tweening motion along a path" on page 155.

To create a motion tween using the Motion Tweening option:

1 Click a layer name to make it the active layer, and select an empty keyframe in the layer where you want the animation to start.

2 To create the first frame of the motion tween, do one of the following:

   - Create a graphic object with the Pen, Oval, Rectangle, Pencil, or Brush tool, then convert it to a symbol. For more information on converting objects to symbols, see "Creating symbols" on page 48.
   - Create an instance, group, or text block on the Stage.
   - Drag an instance of a symbol from the Library panel.

3 Create a second keyframe where you want the animation to end, then select the ending frame (immediately to the left of the second keyframe on the Timeline).

4 Do any of the following to modify the instance, group, or text block in the ending frame:

   - Move the item to a new position.
   - Modify the item's size, rotation, or skew.
   - Modify the item's color (instance or text block only).

   To tween the color of elements other than instances or text blocks, use shape tweening. See "Tweening shapes" on page 156.

5 Click any frame in the tween's frame span and select Motion from the Tween pop-up menu in the Property inspector (Window > Properties).

6 If you modified the size of the item in step 4, select Scale to tween the size of the selected item.

7 Drag the arrow next to the Easing value or enter a value to adjust the rate of change between tweened frames:

   - To begin the motion tween slowly and accelerate the tween toward the end of the animation, drag the slider up or enter a negative value between -1 and -100.
   - To begin the motion tween rapidly and decelerate the tween toward the end of the animation, drag the slider down or enter a positive value between 1 and 100.

   By default, the rate of change between tweened frames is constant. Easing creates a more natural appearance of acceleration or deceleration by gradually adjusting the rate of change.

8 To rotate the selected item while tweening, select an option from the Rotate menu:

   - Select None (the default setting) to prevent rotation.
   - Select Auto to rotate the object once in the direction requiring the least motion.
   - Select Clockwise (CW) or Counterclockwise (CCW) to rotate the object as indicated, and then enter a number to specify the number of rotations.

   Note: The rotation in step 9 is in addition to any rotation you applied to the ending frame in step 4

9 If you're using a motion path, select Orient to Path to orient the baseline of the tweened element to the motion path. (See "Tweening motion along a path" on page 155.)

10 Select the Sync option in the Property inspector to synchronize the animation of graphic symbol instances with the main Timeline.

Note: Modify > Timeline > Synchronize Symbols and the Sync option both recalculate the number of frames in a tween to match the number of frames allotted to it in the Timeline.

11 If you're using a motion path, select Snap to attach the tweened element to the motion path by its registration point.

To create a motion tween using the Create Motion Tween command:

1 Select an empty keyframe and draw an object on the Stage, or drag an instance of a symbol from the Library panel.

Note: To create a tween, you must have only one item on the layer.

2 Select Insert > Timeline > Create Motion Tween.

If you drew an object in step 1, Flash automatically converts the object to a symbol and assigns it the name tween1.

3 Click inside the frame where you want the animation to end, and select Insert > Timeline > Frame.

4 Move the object, instance, or text block on the Stage to the desired position. Adjust the size of the element if you want to tween its scale. Adjust the rotation of the element if you want to tween its rotation. Deselect the object when you have completed adjustments.

A keyframe is automatically added to the end of the frame range.

5 Drag the arrow next to the Easing value or enter a value to adjust the rate of change between tweened frames:

- To begin the motion tween slowly and accelerate the tween toward the end of the animation, drag the slider up or enter a value between -1 and -100.

- To begin the motion tween rapidly and decelerate the tween toward the end of the animation, drag the slider down or enter a positive value between 1 and 100.

By default, the rate of change between tweened frames is constant. Easing creates a more natural appearance of acceleration or deceleration by gradually adjusting the rate of change.

6 To rotate the selected item while tweening, select an option from the Rotate menu:

- Select Auto to rotate the object once in the direction requiring the least motion.

- Select Clockwise (CW) or Counterclockwise (CCW) to rotate the object as indicated, and then enter a number to specify the number of rotations.

Note: The rotation in step 6 is in addition to any rotation you applied to the ending frame in step 4.

7 If you're using a motion path, select Orient to Path to orient the baseline of the tweened element to the motion path. (See "Tweening motion along a path" on page 155.)

8 Select Synchronize to ensure that the instance loops properly in the main document.

Use the Synchronize command if the number of frames in the animation sequence inside the symbol is not an even multiple of the number of frames the graphic instance occupies in the document.

9 If you're using a motion path, select Snap to attach the tweened element to the motion path by its registration point.

Tweening motion along a path

Motion guide layers let you draw paths along which tweened instances, groups, or text blocks can be animated. You can link multiple layers to a motion guide layer to have multiple objects follow the same path. A normal layer that is linked to a motion guide layer becomes a guided layer.

To create a motion path for a tweened animation:

1 Create a motion-tweened animation sequence as described in "Tweening instances, groups, and type" on page 152.

If you select Orient to Path, the baseline of the tweened element orients to the motion path. If you select Snap, the registration point of the tweened element snaps to the motion path.

2 Do one of the following:

- Select the layer containing the animation and select Insert > Timeline > Motion Guide.
- Right-click (Windows) or Control-click (Macintosh) the layer containing the animation and select Add Motion Guide from the context menu.

Flash creates a new layer above the selected layer with a motion guide icon to the left of the layer name.

3 Use the Pen, Pencil, Line, Circle, Rectangle, or Brush tool to draw the desired path.

4 Snap the center to the beginning of the line in the first frame, and to the end of the line in the last frame.

Note: For best snapping results, drag the symbol by its registration point.

5 To hide the motion guide layer and the line so that only the object's movement is visible while you work, click in the Eye column on the motion guide layer.

The group or symbol follows the motion path when you play the animation.

To link layers to a motion guide layer, do one of the following:

- Drag an existing layer below the motion guide layer. The layer is indented under the motion guide layer. All objects on this layer automatically snap to the motion path.
- Create a new layer under the motion guide layer. Objects you tween on this layer are automatically tweened along the motion path.
- Select a layer below a motion guide layer. Select Modify > Timeline > Layer Properties and select Guided in the Layer Properties dialog box.

To unlink layers from a motion guide layer:

1　Select the layer you want to unlink.

2　Do one of the following:

- Drag the layer above the motion guide layer.
- Select Modify > Timeline > Layer Properties and select Normal as the layer type in the Layer Properties dialog box.

Tweening shapes

By tweening shapes, you can create an effect similar to morphing, making one shape appear to change into another shape over time. Flash can also tween the location, size, and color of shapes.

Tweening one shape at a time usually yields the best results. If you tween multiple shapes at one time, all the shapes must be on the same layer.

To apply shape tweening to groups, instances, or bitmap images, you must first break these elements apart. See "Breaking apart groups and objects" on page 144. To apply shape tweening to text, you must break the text apart twice to convert the text to objects. See "Breaking text apart" on page 109.

To control more complex or improbable shape changes, you use shape hints, which control how parts of the original shape move into the new shape. See "Using shape hints" on page 157.

To tween a shape:

1　Click a layer name to make it the active layer, and create or select a keyframe where you want the animation to start.

2　Create or place the artwork for the first frame of the sequence. For best results, the frame should contain only one item (a graphic object or broken-apart group, bitmap, instance, or text block).

3　Select the keyframe in the Timeline.

4　Select Window > Properties.

5　In the Property inspector, select Shape from the Tween pop-up menu.

6　Drag the arrow next to the Easing value or enter a value to adjust the rate of change between tweened frames:

- To begin the shape tween gradually and accelerate the tween toward the end of the animation, drag the slider down or enter a negative value between -1 and -100.
- To begin the shape tween rapidly and decelerate the tween toward the end of the animation, drag the slider up or enter a positive value between 1 and 100.

By default, the rate of change between tweened frames is constant. Easing creates a more natural appearance of transformation by gradually adjusting the rate of change.

7　Select an option for Blend:

Distributive creates an animation in which the intermediate shapes are smoother and more irregular.

Angular creates an animation that preserves apparent corners and straight lines in the intermediate shapes.

Note: Angular is appropriate only for blending shapes with sharp corners and straight lines. If the shapes you select do not have corners, Flash reverts to distributive shape tweening.

8　Create a second keyframe the desired number of frames after the first keyframe.

9 With the second keyframe selected, select the artwork you placed in the first keyframe and do one of the following:

- Modify the shape, color, or position of the artwork.
- Delete the artwork and place new artwork in the second keyframe.

Using shape hints

To control more complex or improbable shape changes, you can use shape hints. Shape hints identify points that should correspond in starting and ending shapes. For example, if you are tweening a drawing of a face as it changes expression, you can use a shape hint to mark each eye. Then, instead of the face becoming an amorphous tangle while the shape change takes place, each eye remains recognizable and changes separately during the shift.

Shape hints contain letters (*a* through *z*) for identifying which points correspond in the starting and ending shape. You can use up to 26 shape hints.

Shape hints are yellow in a starting keyframe, green in an ending keyframe, and red when not on a curve.

For best results when tweening shapes, follow these guidelines:

- In complex shape tweening, create intermediate shapes and tween them instead of just defining a starting and ending shape.
- Make sure that shape hints are logical. For example, if you're using three shape hints for a triangle, they must be in the same order on the original triangle and on the triangle to be tweened. The order cannot be *abc* in the first keyframe and *acb* in the second.
- Shape hints work best if you place them in counterclockwise order beginning at the top left corner of the shape.

To use shape hints:

1 Select the first keyframe in a shape-tweened sequence.

2 Select Modify > Shape > Add Shape Hint.

   The beginning shape hint appears as a red circle with the letter *a* somewhere on the shape.

3 Move the shape hint to a point that you want to mark.

4 Select the last keyframe in the tweening sequence.

   The ending shape hint appears somewhere on the shape as a green circle with the letter *a*.

5 Move the shape hint to the point in the ending shape that should correspond to the first point you marked.

6 Play the animation again to see how the shape hints change the shape tweening. Move the shape hints to fine-tune the tweening.

7 Repeat this process to add additional shape hints. New hints appear with the letters that follow (*b, c,* and so on).

You can choose to view all shape hints, and you can remove shape hints.

To see all shape hints:

- Select View > Show Shape Hints. The layer and keyframe that contain shape hints must be active for Show Shape Hints to be available.

To remove a shape hint:

* Drag it off the Stage.

To remove all shape hints:

* Select Modify > Shape > Remove All Hints.

Creating frame-by-frame animations

To create a frame-by-frame animation, you define each frame as a keyframe and create a different image for each frame. Each new keyframe initially contains the same contents as the keyframe preceding it, so you can modify the frames in the animation incrementally.

To create a frame-by-frame animation:

1 Click a layer name to make it the active layer, and select a frame in the layer where you want the animation to start.

2 If the frame isn't already a keyframe, select Insert > Timeline > Keyframe to make it one.

3 Create the artwork for the first frame of the sequence.

You can use the drawing tools, paste graphics from the Clipboard, or import a file.

4 Click the next frame to the right in the same row and select Insert > Timeline > Keyframe, or right-click (Windows) or Control-click (Macintosh) and select Insert Keyframe from the context menu.

This adds a new keyframe whose contents are the same as those of the first keyframe.

5 Alter the contents of this frame on the Stage to develop the next increment of the animation.

6 To complete your frame-by-frame animation sequence, repeat steps 4 and 5 until you've built the motion you want.

7 To test the animation sequence, select Control > Play or click the Play button on the Controller.

Editing animation

After you create a frame or a keyframe, you can move it elsewhere in the active layer or to another layer, remove it, and make other changes. Only keyframes are editable. You can view tweened frames, but you can't edit them directly. To edit tweened frames, you change one of the defining keyframes or insert a new keyframe between the beginning and ending keyframes. You can drag items from the Library panel onto the Stage to add the items to the current keyframe.

To display and edit more than one frame at a time, you use onion skinning. See "Onion skinning" on page 159.

To insert frames in the Timeline, do one of the following:

* To insert a new frame, select Insert > Timeline > Frame.

* To create a new keyframe, select Insert > Timeline > Keyframe, or right-click (Windows) or Control-click (Macintosh) the frame where you want to place a keyframe, and select Insert Keyframe from the context menu.

* To create a new blank keyframe, select Insert > Timeline > Blank Keyframe, or right-click (Windows) or Control-click (Macintosh) the frame where you want to place the keyframe, and select Insert Blank Keyframe from the context menu.

To delete or modify a frame or keyframe, do one of the following:

- To delete a frame, keyframe, or frame sequence, select the frame, keyframe, or sequence and right-click (Windows) or Control-click (Macintosh) the frame, keyframe, or sequence and select Remove Frames from the context menu. Surrounding frames remain unchanged.

- To move a keyframe or frame sequence and its contents, select the keyframe or sequence, then drag to the desired location.

- To extend the duration of a keyframe, Alt-drag (Windows) or Option-drag (Macintosh) the keyframe to the final frame of the new sequence.

- To copy a keyframe or frame sequence by dragging, select the keyframe or sequence, then Alt-drag (Windows) or Option-drag (Macintosh) to the new location.

- To copy and paste a frame or frame sequence, select the frame or sequence and select Edit > Timeline > Copy Frames. Select a frame or sequence that you want to replace, and select Edit > Timeline > Paste Frames.

- To convert a keyframe to a frame, select the keyframe and select Modify > Timeline > Clear Keyframe, or right-click (Windows) or Control-click (Macintosh) the keyframe and select Clear Keyframe from the context menu. The cleared keyframe and all frames up to the subsequent keyframe are replaced with the contents of the frame preceding the cleared keyframe.

- To change the length of a tweened sequence, drag the beginning or ending keyframe left or right. To change the length of a frame-by-frame sequence, see "Creating frame-by-frame animations" on page 158.

- To add a library item to the current keyframe, drag the item from the Library panel onto the Stage.

- To reverse an animation sequence, select the appropriate frames in one or more layers and select Modify > Timeline > Reverse Frames. There must be keyframes at the beginning and end of the sequence.

Onion skinning

Normally, Flash displays one frame of the animation sequence at a time on the Stage. To help you position and edit a frame-by-frame animation, you can view two or more frames on the Stage at once. The frame under the playhead appears in full color, while surrounding frames are dimmed, making it appear as if each frame were drawn on a sheet of translucent onion-skin paper and the sheets were stacked on top of each other. Dimmed frames cannot be edited.

To simultaneously see several frames of an animation on the Stage:

- Click the Onion Skin button. All frames between the Start Onion Skin and End Onion Skin markers (in the Timeline header) are superimposed as one frame in the Document window.

To control onion skinning display, do any of the following:

- To display onion skinned frames as outlines, click the Onion Skin Outlines button.

- To change the position of either onion skin marker, drag its pointer to a new location. (Normally, the onion skin markers move in conjunction with the current frame pointer.)

- To enable editing of all frames between onion skin markers, click the Edit Multiple Frames button. Usually onion skinning lets you edit only the current frame. However, you can display the contents of each frame between the onion skin markers normally, and make each available for editing, regardless of which is the current frame.

  Note: Locked layers (those with a padlock icon) aren't displayed when onion skinning is turned on. To avoid a multitude of confusing images, you can lock or hide the layers you don't want onion skinned.

To change the display of onion skin markers:

- Click the Modify Onion Markers button and select an item from the menu:

  Always Show Markers displays the onion skin markers in the Timeline header whether or not onion skinning is on.

  Anchor Onion locks the onion skin markers to their current position in the Timeline header. Normally, the Onion Skin range is relative to the current frame pointer and the Onion Skin markers. By anchoring the Onion Skin markers, you prevent them from moving with the current frame pointer.

  Onion 2 displays two frames on either side of the current frame.

  Onion 5 displays five frames on either side of the current frame.

  Onion All displays all frames on either side of the current frame.

Moving an entire animation

If you need to move an entire animation on the Stage, you must move the graphics in all frames and layers at once to avoid realigning everything.

To move the entire animation to another location on the Stage:

1 Unlock all layers.

   To move everything on one or more layers but nothing on other layers, lock or hide all the layers you don't want to move.

2 Click the Edit Multiple Frames button in the Timeline.

3 Drag the onion skin markers so that they enclose all the frames you want to select, or click Modify Onion Markers and select Onion All.

4 Select Edit > Select All.

5 Drag the entire animation to the new location on the Stage.

Using mask layers

For spotlight effects and transitions, you can use a mask layer to create a hole through which underlying layers are visible. A mask item can be a filled shape, a type object, an instance of a graphic symbol, or a movie clip. You can group multiple layers together under a single mask layer to create sophisticated effects.

To create dynamic effects, you can animate a mask layer. For a filled shape used as a mask, you use shape tweening; for a type object, graphic instance, or movie clip, you use motion tweening. When using a movie clip instance as a mask, you can animate the mask along a motion path.

To create a mask layer, you place a mask item on the layer that you want to use as a mask. Instead of having a fill or stroke, the mask item acts as a window that reveals the area of linked layers that lie beneath it. The rest of the mask layer conceals everything except what shows through the mask item. A mask layer can contain only one mask item. You cannot have a mask layer inside a button, and you cannot apply a mask to another mask.

You can also use ActionScript to create a mask layer from a movie clip. A mask layer created with ActionScript can be applied only to another movie clip.

To create a mask layer:

1   Select or create a layer containing the objects to appear inside the mask.

2   With the layer selected, select Insert > Timeline > Layer to create a new layer above it.

A mask layer always masks the layer immediately below it, so be sure to create the mask layer in the proper place.

3   Place a filled shape, text, or an instance of a symbol on the mask layer.

Flash ignores bitmaps, gradients, transparency, colors, and line styles in a mask layer. Any filled area is completely transparent in the mask; any nonfilled area is opaque.

4   Right-click (Windows) or Control-click (Macintosh) the mask layer's name in the Timeline, and select Mask from the context menu.

The layer is converted to a mask layer, indicated by a mask layer icon. The layer immediately below it is linked to the mask layer, and its contents show through the filled area on the mask. The masked layer name is indented, and its icon changes to a masked layer icon.

5   To display the mask effect in Flash, lock the mask layer and the masked layer.

To mask additional layers after creating a mask layer, do one of the following:

- Drag an existing layer directly below the mask layer.
- Create a new layer anywhere below the mask layer.
- Select Modify > Timeline > Layer Properties and select Masked in the Layer Properties dialog box.

To unlink layers from a mask layer:

1   Select the layer you want to unlink.

2   Do one of the following:

   ■ Drag the layer above the mask layer.
   ■ Select Modify > Timeline > Layer Properties and select Normal.

To animate a filled shape, type object, or graphic symbol instance on a mask layer:

1 Select the mask layer in the Timeline.

2 Click in the Lock column to unlock the mask layer.

3 Do one of the following:

   - If the mask object is a filled shape, apply shape tweening to the object as described in "Tweening shapes" on page 156.

   - If the mask object is a type object or graphic symbol instance, apply motion tweening to the object as described in "Tweening instances, groups, and type" on page 152.

4 When you've completed the animation operation, click in the Lock column for the mask layer to lock the layer again.

To animate a movie clip on a mask layer:

1 Select the mask layer in the Timeline.

2 Double-click the movie clip on the Stage to edit the movie clip in place and to display the movie clip's Timeline.

3 Apply motion tweening to the movie clip as described in "Tweening instances, groups, and type" on page 152. To animate the movie clip on a motion path, see "Tweening motion along a path" on page 155.

4 When you've completed the animation procedure, click the Back button in the Edit in Place window to return to document-editing mode.

5 Click in the Lock column for the mask layer to lock the layer again.

CHAPTER 10
Working with Video

Macromedia Flash MX 2004 and Macromedia Flash MX Professional 2004 provide a variety of ways for you to include video in your Flash documents:

- You can import video clips into Flash as embedded files in MOV, AVI, MPEG, or other formats, depending on your system. Just like an imported bitmap or vector artwork file, an embedded video file becomes part of the Flash document. For information on file formats supported for importing embedded video, see "About file formats for imported video" on page 164.

- You can import video clips in Macromedia Flash Video (FLV) format directly into Flash. When you import FLV files, you can use the encoding options already applied to the files. You do not need to select encoding options during import. See "Importing Macromedia Flash Video (FLV) files" on page 173.

  Note: You can export video clips in FLV format from Flash, for use in Flash documents or other applications. See "Macromedia Flash Video (FLV)" on page 315.

- You can play back external FLV files in a Flash document at runtime, using the NetConnection and NetStream objects in ActionScript. See "About playing back external FLV files dynamically" on page 174.

- You can import video clips in QuickTime format as linked files. Flash documents that contain linked QuickTime video must be published in QuickTime format. A linked video file does not become part of the Flash document. Instead, the Flash document maintains a pointer to the linked file. See "Importing linked QuickTime video files" on page 173.

- If you have Macromedia Flash MX Professional 2004, you can use the FLV file format to create and import video in a streamlined workflow. You can export FLV files from video-editing applications using the Macromedia Flash Video (FLV) plug-in. See "Exporting FLV files from video-editing applications (Flash Professional only)" on page 178. You can play back FLV files using the streaming media components. See "Playing FLV video clips with media components (Flash Professional only)" on page 180.